ENGINEERING NEWS-RECORD

Welton Becket: This time a client p.60

A McGRAW-HILL PUBLICATION

How McLouth Steel stores 160,000 gallons of liquid

OXYGEN

with negligible boil-off

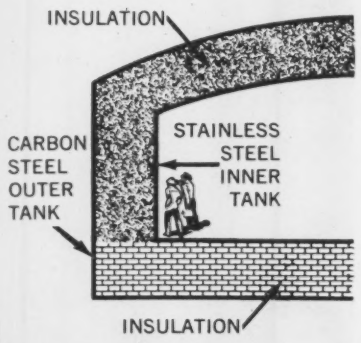
McLouth Steel Corporation needed a large-capacity vessel for storing liquid oxygen at its Trenton, Michigan mill. CB&I fulfilled the requirement with this 52 ft. diameter, specially-insulated, double-wall dome roof tank.

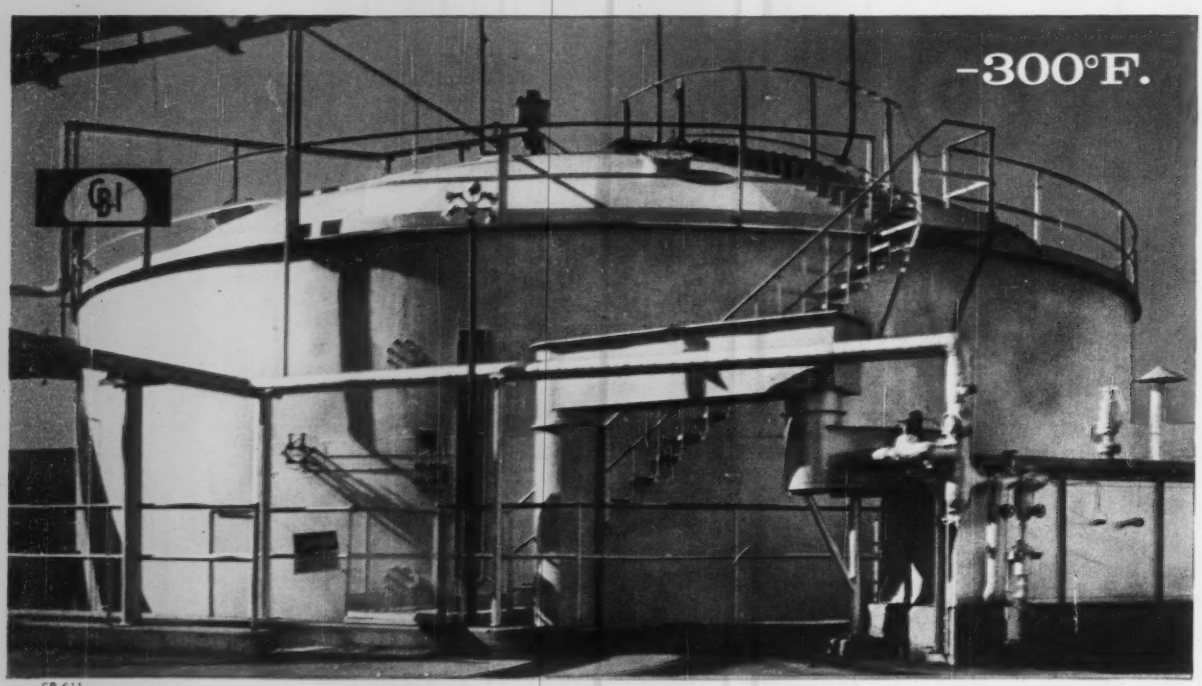
The 160,000 gallons (about 800 tons) of liquid oxygen it stores is kept at a constant −300°F. The six-foot space between the walls, twice the usual insulation provision, assures negligible boil-off.

A second tank recently completed for McLouth, is evidence of the success of this CB&I design.

You will value the depth of CB&I's experience in designing and building cryogenic storage tanks. That's why it pays to start your investigations by calling CB&I.

Write for our Brochure G-50, "Cryogenic Storage Vessels."





CB-611

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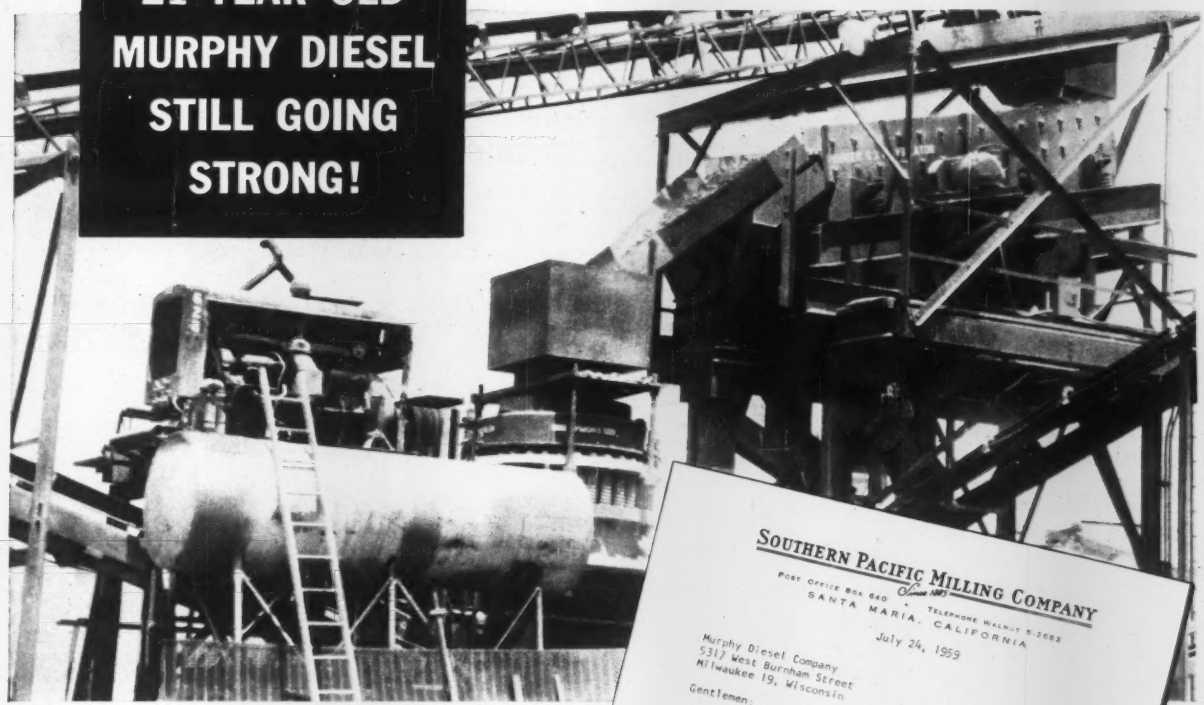
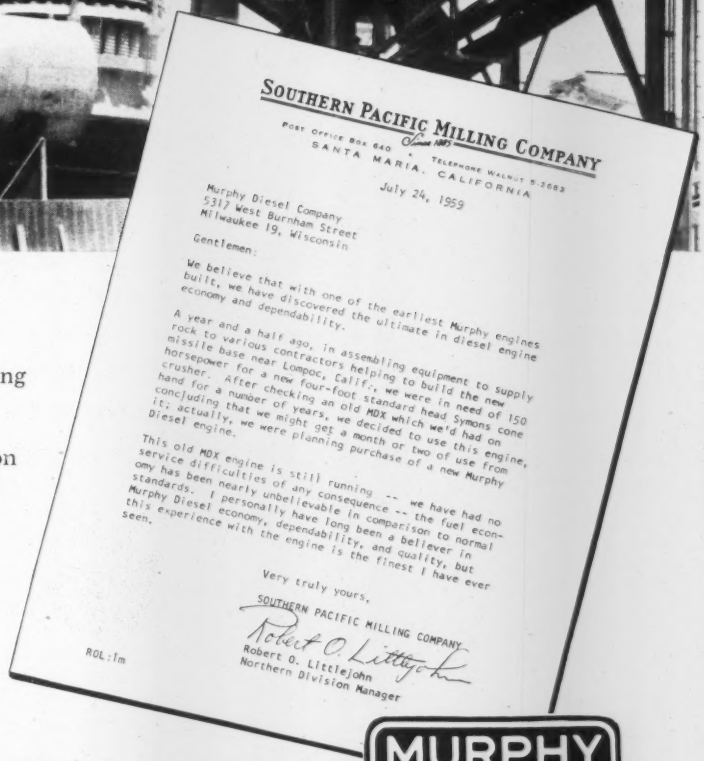
21 YEAR OLD MURPHY DIESEL STILL GOING STRONG!





SOUTHERN PACIFIC MILLING COMPANY

POST OFFICE BOX 640 TELEPHONE WALNUT 5-2683
SANTA MARIA, CALIFORNIA

July 24, 1959

Murphy Diesel Company
5317 West Burnham Street
Milwaukee 19, Wisconsin

Gentlemen:

We believe that with one of the earliest Murphy engines built, we have discovered the ultimate in diesel engine economy and dependability.

A year and a half ago, in assembling equipment to supply rock to various contractors helping to build the new missile base near Lompoc, Calif., we were in need of 150 horsepower for a new four-foot standard head Symons cone crusher. After checking an old MDX which we'd had on hand for a number of years, we decided to use this engine, concluding that we might get a month or two of use from it; actually, we were planning purchase of a new Murphy Diesel engine.

This old MDX engine is still running -- we have had no service difficulties of any consequence -- the fuel economy has been nearly unbelievable in comparison to normal standards. I personally have long been a believer in Murphy Diesel economy, dependability, and quality, but this experience with the engine is the finest I have ever seen.

Very truly yours,

SOUTHERN PACIFIC MILLING COMPANY

Robert O. Littlejohn

Robert O. Littlejohn
Northern Division Manager

ROL:fm

Proof that Murphy Diesel saves you money

This early model Murphy is still earning its way! According to the owner, it is operating efficiently with fuel economy that is "nearly unbelievable in comparison to normal standards." The experience of Southern Pacific Milling Company with this 21-year-old Murphy is the best evidence that operators who want "the ultimate in Diesel engine economy and dependability" are wise to choose Murphy.

Twenty-one years of improvement in diesel engine design and construction make today's Murphy Diesel first choice for always-dependable, low-cost operation.

418N

MURPHY DIESEL

MURPHY DIESEL COMPANY

5321 W. Burnham St., Milwaukee, Wisconsin

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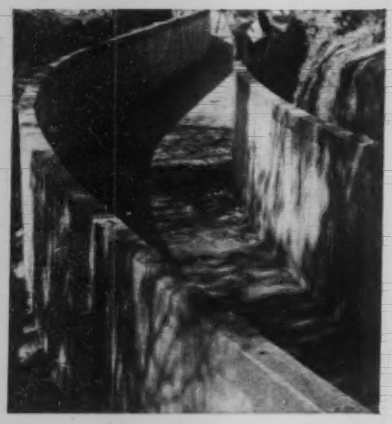
Throughout the Nation

HEAVY-DUTY POWER FOR CONSTRUCTION

Murphy Diesel engines and power units are available in sizes from 105 to 420 HP with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 70 to 227 K.W.

400 Feet Daily



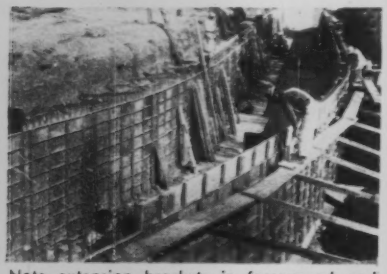
Extension Brackets and Symons Steel-Ply Forms

. . . enable contractor to pour at 15c a Square Foot

California contractor, Elmer J. Freethy saved substantially in pouring a channel lining for a flood control project at Pleasant Hill, California. It involved curved walls 9 ft high and 4,000 ft long.

Symons 8 ft Steel-Ply Forms were used with Symons New Extension Bracket, to get the additional foot. In addition to speed, the extension gave the final foot the appearance of a cap on the wall.

Wall specs called for a ½" extension joint every 40 lineal feet. The contractor had the ½" premoulded material cut 3" wider than the wall and used the wall forms to hold it in position. By using a 1" filler on these joints they were able to tie the forms together with long connecting bolts and pour the walls continuously.



Note extension brackets in foreground and minimum amount of bracing required for curved walls.

Symons Steel-Ply Forms are *rented with purchase option.*

Symons

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HERE'S a high bridge job! Men on the structure! Prestressed beams to handle!—A typical situation, where anything *short* of perfection in operation and control is not enough. On a job like this proper performance of your cranes means money.

Northwest brings you the finest combination of crane operating advantages. The operator has smooth, dependable booming guaranteed by the rugged Northwest Independent High Speed Boom Hoist. In his hand he has the true "feel" of his load. He knows what the hook is doing! With the Northwest Feather-Touch Clutch Control, power does the work.

And the Swing—important with high booms. Uniform Pressure Swing Clutches, as on all Northwests! He can move that boom tip smoothly and accurately without jerk or jar.

He can have power-lowering which is really power lowering with safety not a make shift. He can have a third drum, sectional jibs for rapid variation of length as required, pin or flanged type booms, block and skid steering or Northwest differential type steering and many other features that make crane work smoother and faster.

These features combine with the many other Northwest advantages that enable Northwests to do a better, safer job on a wider variety of work in less time and *at lower cost.*

There is a lot more to tell you. Let a Northwest man give you the full story.

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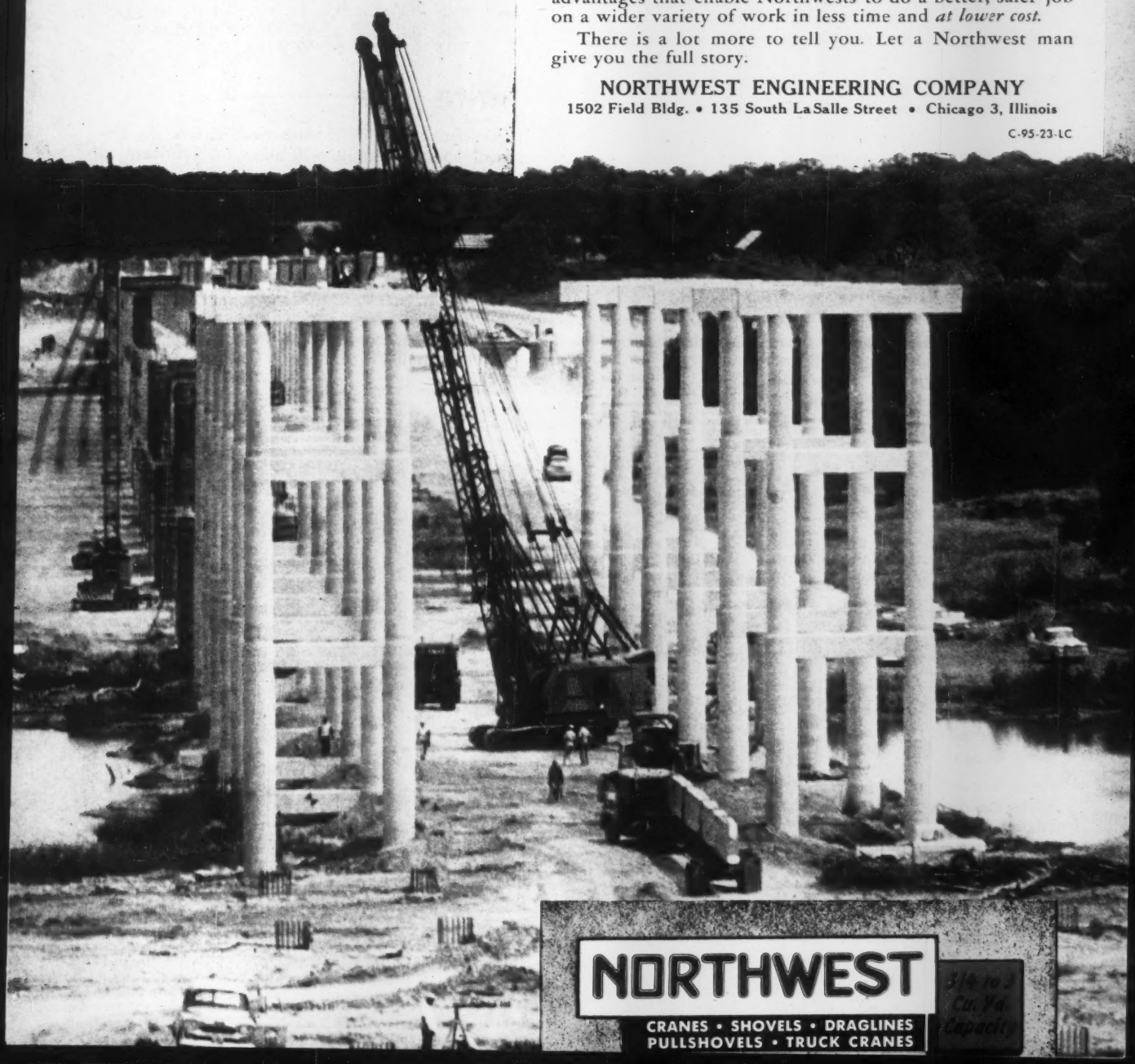


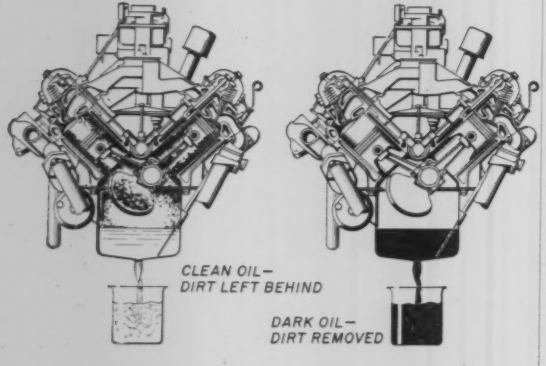
LUBE LOGIC 5 new ways

Warm bath restores wire rope

The best way to get lubricant inside a cable, where it's really needed, is to immerse the cable or wire rope every 500 hours or so in a bath of warmed-up Texaco Crater A lubricant. It pays off by giving you far longer service life than you would get simply by applying Crater A externally.

This warm-bath treatment requires a horizontal trough to hold the lubricant. The trough should be fitted with pulleys to keep the cable completely submerged while it's passing through. A burlap collar should be rigged to wipe off excess lubricant as the cable leaves the box. An immersion of about a minute will allow the lubricant to work well into the strands.

This process is *not* an alternative to other lubrication. You should continue to clean the cable and apply Crater A externally every 10 to 100 hours, depending on the type of work the cable is doing. Remember also to be very sparing with lubricants on cables that wind on clutch-equipped drums, and never lubricate cables that are dragged in dirt.



Dark engine oil . . . sign of a hard worker

Here's a motor-oil misconception that's still common enough to need discussion. Some folks think that the better an engine oil is, the more likely it is to come out as clean as it went in. The truth of the matter is just the other way around. A good detergent-dispersant oil holds onto dirt like an old friend. It keeps dust, soot and carbon in suspension, and carries it out of the engine when you drain the oil. Oil that looks clean when you drain it from the crankcase is a sign that these contaminants may still be inside the engine. Moral: oil that darkens in use is really doing its job.

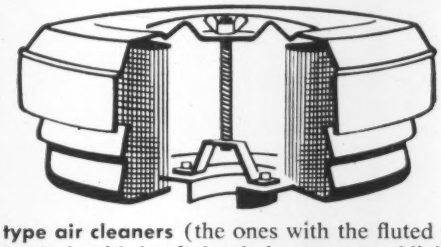
No-sweat way to adjust crawler treads

Crawler treads are easier to adjust if you dab a little Texaco Threadtex on the adjusting screws. The Threadtex stays put through months of service, keeps the screws free-turning and corrosive-proof. Another good use for Threadtex is on track bolts, when you're making up track. A little dab of Threadtex on the bolts will save a lot of time and work in taking down track after it has been in service.

to trim downtime

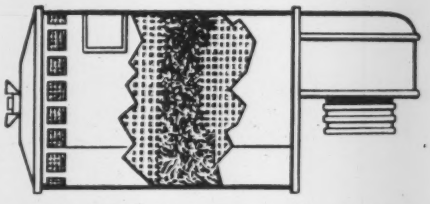
Key points on air filter maintenance

In a day's operation a typical engine inhales several thousand cubic feet of air, and on a construction project all that air is probably loaded with abrasive dirt and dust. Good air-filter maintenance is the only way to make sure your engine gets the air and *not* the dirt. Here are some maintenance tips that will keep your air filter working better through thick and thin.

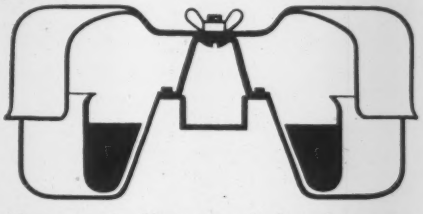


Dry type air cleaners (the ones with the fluted paper element) should simply be shaken or tapped lightly to remove dirt, and reinstalled. Never clean dry-type elements with kerosine or diesel fuel.

Additional precautions: empty centrifugal precleaners when the glass container is half full; don't remove the oil cup when the engine is running.

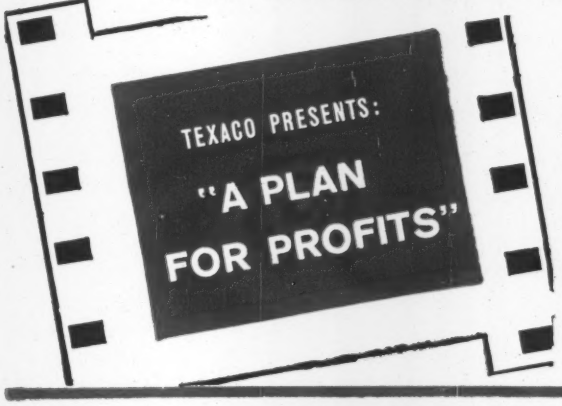


If your filter is the wire gauze type, and you want to re-use the element, wash the gauze in kerosine or diesel fuel, shake it dry *(don't* blow it with compressed air) and re-oil it with SAE 40 or SAE 50 oil to coat the element.



Oil-bath type air filters won't function properly if there's more than a half inch of sediment at the bottom of the oil reservoir. Check the sediment level by sticking a screw-driver down into the oil, and if you're anywhere near the half-inch level the bowl should be cleaned out and refilled. Also, inspect the filter every 5 to 50 hours to make sure the oil itself is at the right level. Every 500 hours the whole cleaner should be dismantled and cleaned, and refilled with new engine oil of the same grade used in the crankcase.

New Texaco movie can help boost your profits



This factual, down-to-earth presentation shows you how 1% of your total budget (the amount usually spent on lubricants) can minimize a major cause of equipment downtime.

SEE: How the biggest engineering job ever undertaken was 90% lubricated with only *four* different products.

SEE: How one contractor lubricated 21 different types of equipment with only seven products.

SEE: "A Plan for Profits"—Texaco's newest sound and color movie.

FOR AN EARLY SHOWING contact your Texaco Contractor Representative *now.*

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Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Man is your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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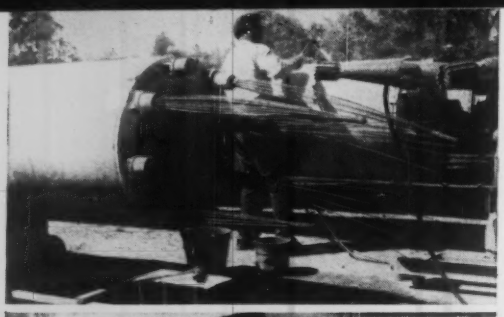
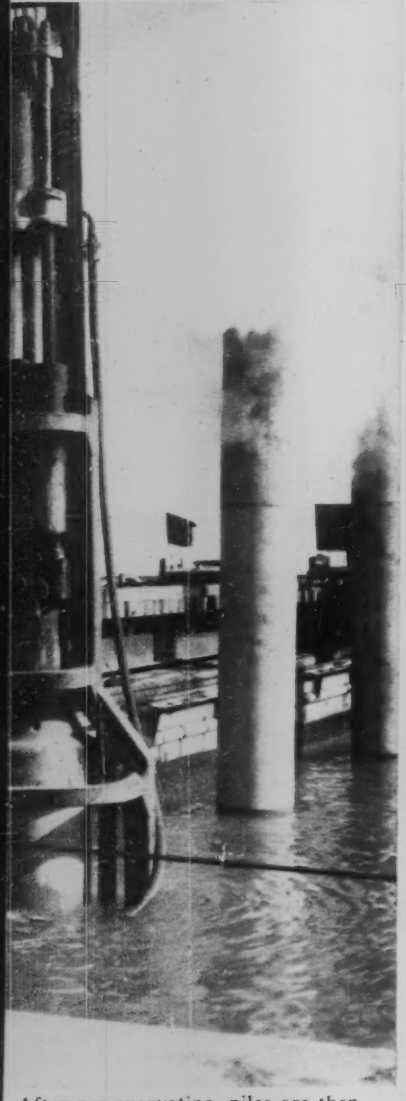
1. Stressing piles for the project at yard in Beloit, Ill.

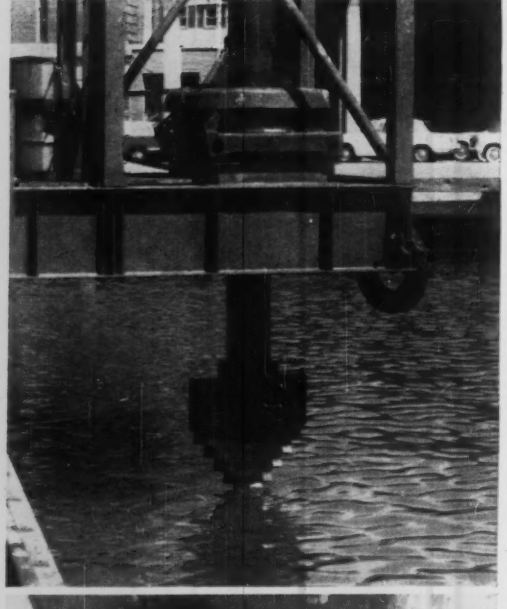


2. Frogmen are called in for lake bottom examination.

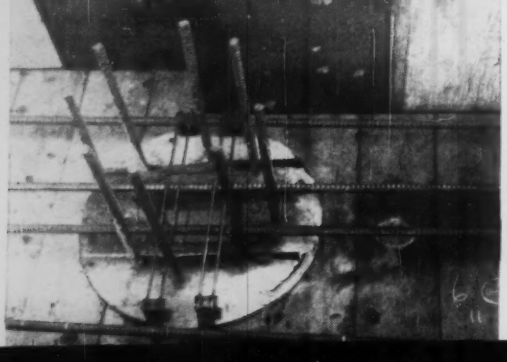
3. Rotary drill with 35"-diameter fishtail bit, used for pre-excavation for placement of piles.



After pre-excavating, piles are then driven to prescribed bearing depth.

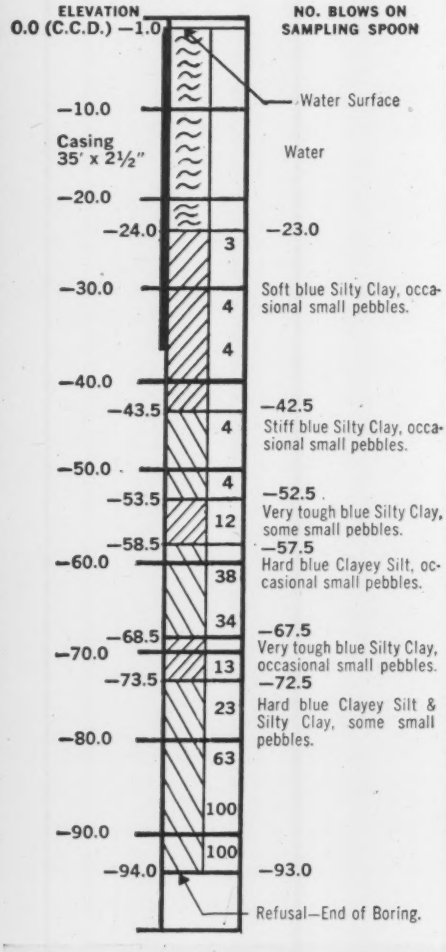


5. Plugged pile with dowels in place to receive cap and prestressed, precast deck.



CLIENT: City of Chicago, Ill. ENGINEER: Department of Public Works, Bureau of Engineering. PRIME CONTRACTOR: Raymond International Incorporated, North American General Contracting Division.

Chart of soil boring indicates many non-supporting layers of silty clay to depth of below lake level of approximately 73.5 feet.



6. Precast caps ready for deck placement.

Chicago Pier project shows advantages of

RAYMOND

Prestressed Concrete Cylinder Piles...

THE PROJECT

A 1247-foot long, 96-foot wide extension on the south side of Chicago's Navy Pier. It is used for general cargo operations and accommodates vessels of ocean-going size. Precast, prestressed deck rests on 318, 36″ diameter Raymond prestressed concrete cylinder piles, averaging 77 feet in length. Pile tops have cast-in-place concrete plugs with reinforcing dowels, with the remainder of the pile being hollow. Unusual subsoil conditions, disclosed by soil borings, dictated a pre-excavation technique (pioneered by Raymond) to a depth within a few feet of ultimate penetration. Piles were then driven by single-acting steam hammer to ultimate bearing depth. The pier supports two railroad tracks and has provisions for trucking and warehousing.

7. Preparing to pour final deck topping.

Advantages of Raymond Cylinder Piles

SPEED

The entire project, including soil investigations, was completed in *one shipping season,* a vital saving of time for such a busy port as Chicago. Piles were spun and stressed in nearby Beloit and trucked rapidly to the jobsite.

ECONOMY

Raymond Prestressed Concrete Cylinder Piles offer an unusually high load-carrying capacity foundation for their size and weight—without the extensive, expensive underwater work needed for caissons of a comparable capacity. Also, these piles are mass-produced, with the resultant savings that the process implies. And maintenance costs are next to nothing.

DURABILITY

This all-concrete pier has great bearing capacity (piles rated at 230 tons, tested to 345 tons), and is highly resistant to weathering, free of corrosion, and of course, fireproof. An expendable, inexpensive combination wood and rubber fender system at dockside protects both pier and ship.

WHY SPEED COUNTS

Since the opening of the St. Lawrence Seaway, Great Lakes cities are now deep-water ports, open to worldwide shipping. Loading and docking space has seldom kept pace with these potential capacities. With Raymond prestressed concrete cylinder piles, these facilities can be completed in record time. And the port with the best dockage will benefit first, with greater income.

PLUS...

Other successful applications for these piles have been on causeways, bridges, offshore drilling platforms, highway overpasses, wharves, breakwaters, and transmission towers. If the advantages described here could apply to any of your projects, send for illustrated brochure CP-3, which gives the story of the Raymond prestressed concrete cylinder pile in full detail. Or give us a call; our engineers will be happy to consult with you.

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who framed this engineer?

He was Sanitary Engineer working on the construction of an Air Force base in Texas*. He's a good engineer—asked for the right kind of sanitary sewer pipe. But the regulations read "lowest bidder," so he got a substitute that he didn't want.

Six years later the substitute pipeline had to be dug up, at tremendous expense to the taxpayer. Everybody forgot by that time that the framed engineer had screamed for the right pipe in the first place.

Before the war, only Lifetime Vitrified Clay Pipe was used in sanitary sewers on Federal projects. During the war, the Clay Pipe people couldn't keep up with the sudden, unprecedented demand, so standards were lowered to allow substitutes.

There's no Clay Pipe shortage now, and there's still no real substitute for Lifetime Vitrified Clay.

But outmoded Federal, State and Municipal regulations haven't been changed. They can mean many more framed engineers.

And taxpayers are forced to spend millions of dollars each year to replace sewer lines that should have been installed with lifetime pipe—Vitrified Clay Pipe with new cost-cutting factory-made compression joints—in the first place.

Name of Air Force base on request.

COMPRESSION SEALED, VITRIFIED
CLAY PIPE
IMPERVIOUS
THE STANDARD in SANITARY SEWERS

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1028 Connecticut Ave., Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

(name)

(company)

(street address)

(city and state)

8-7C23 EN

Reader Comment

'The Colony' Lags Behind

SIR—Concerning the admirable article "Prestressed Concrete: The Infant Is Growing Up," (ENR Oct. 6, 1960, p. 34) it may be of interest to your readers to know that this company alone used 170,000 cu yd of concrete in the production of prestressed planks during the year 1959—compared with 188,000 cu yd for the 56 fabricators covered in your census.

This illustrates how much more rapid the development of this type of prestressed concrete unit has been in the United Kingdom than in the U. S. On the other hand, our production of bridge beams is only a small fraction of that in your country.

K. M. WOOD
Concrete Limited
Hounslow, Middlesex, England

Attitude, Plus

SIR—Concerning your editorial A Matter of Attitude and subsequent Reader Comment in the January 19 issue, it appears appropriate to offer the following observations.

The advisability of design and construction being accomplished under the responsibility of the same Contracting Officer is not questioned, but such an operating procedure is not absolutely necessary or always possible. Nike Zeus test facilities, designed under the managerial and technical supervision of the Mobile District, Corps of Engineers, were constructed under the supervision of both the Army and Navy. Construction on two sites was the responsibility of two District Public Works Officers, Navy, and on the other two sites construction is being handled by two separate District Engineers, Corps of Engineers, Army.

The basic philosophy in design was to place responsibility in one office because of over-all system coordination and need for system compatibility with facilities. Extensive coordination at working levels was of major proportions and has been handled very successfully both in system-facility design and in construction. The success of working level coordination is evident in the fact that approximately $80 million have been placed under contract on schedule

(Reader Comment continues p. 14)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed, Editor Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

You see this 75-ton LORAIN MOTO-CRANE® at work across the country

On a California missile base, an Ohio bridge job, or new plant facilities in Texas, this big, Lorain Moto-Crane is a familiar sight across the country.

OUTRIGGER SET-UP TIME CUT 82%

Lorain's Power-Set® Outriggers are standard on this model. On a Detroit job it took just 5 minutes for this Lorain to retract, move and reset outriggers. And everything was done by the operator from the carrier cab. An ordinary truck crane, with manual outriggers, on the other end of this big lift, took 45 minutes and three steelworkers to do the same thing.

This is how "Power-Set" Outriggers save downtime, men and money.

Two of the many other exclusive Lorain features on this model are: *Square-Tubular-Chord Boom* that is lighter weight, longer, stronger . . . and *"Shear-Ball"* turntable connection, with no maintenance or adjustment problems.

If you need big, rubber tire cranes, ask your nearby Lorain Distributor for all the details. Why not call him now. **THE THEW SHOVEL CO., LORAIN, OHIO**

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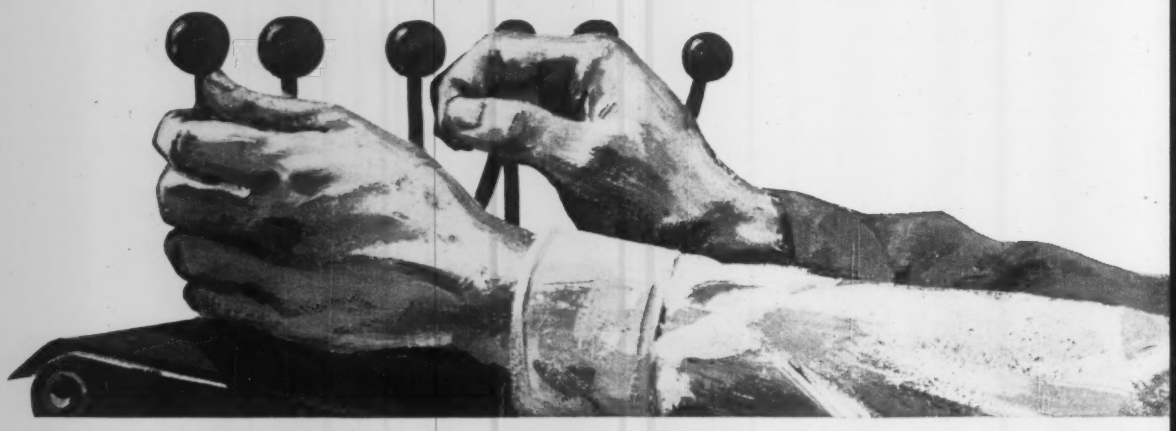
DOES MORE FASTER • FOR LESS

PLANTS in Lorain and Elyria, Ohio.
PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 11,000-lb. to 18,000-lb. lifting capacity.
OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

no sweat, no strain

with Speed-o-Matic power-hydraulic controls



Pinpoint control . . .

SHORT-THROW POWER CONTROLS
insure safe, accurate shovel-crane operation, beat fatigue, boost production

Speed-o-Matic is not an air, partial booster or mechanical system. Basically, it's the same precise power-hydraulic control system you find on aircraft, machine tools, farm equipment — your own family car if it has power-brakes or steering.

On a Link-Belt Speeder the true power-hydraulic controls govern all fundamental shovel-crane operations — booming, swing and travel, load lowering/hoist and steer. To slip the machine into action you merely nudge short-throw control levers. Response is instant and smooth; no delay for pressure build-up . . . no jump . . . no snap.

Ask any Speed-o-Matic operator. He'll tell you it's the most fatigue-free, productive system he's ever worked . . . and the safest too! Speed-o-Matic lets him spot loads with pinpoint accuracy, lets him maneuver with wrist-action simplicity, lets him concentrate on the job, not the machine.

Speed-o-Matic power-hydraulic controls are standard on the entire Link-Belt Speeder line

1936 / 1961 — 25 years of controls leadership

Easy maintenance...

HYDRAULIC SYSTEM PRACTICALLY MAINTENANCE-FREE — Speed-o-Matic clutches automatically compensate for heat and normal lining wear

The Speed-o-Matic hydraulic system requires no priming or bleeding — only routine seasonal oil changes. There are no bushings, pins, links, clutch toggles. The actuating mechanism is oil-immersed. A micronic-type, replaceable filter keeps oil clean.

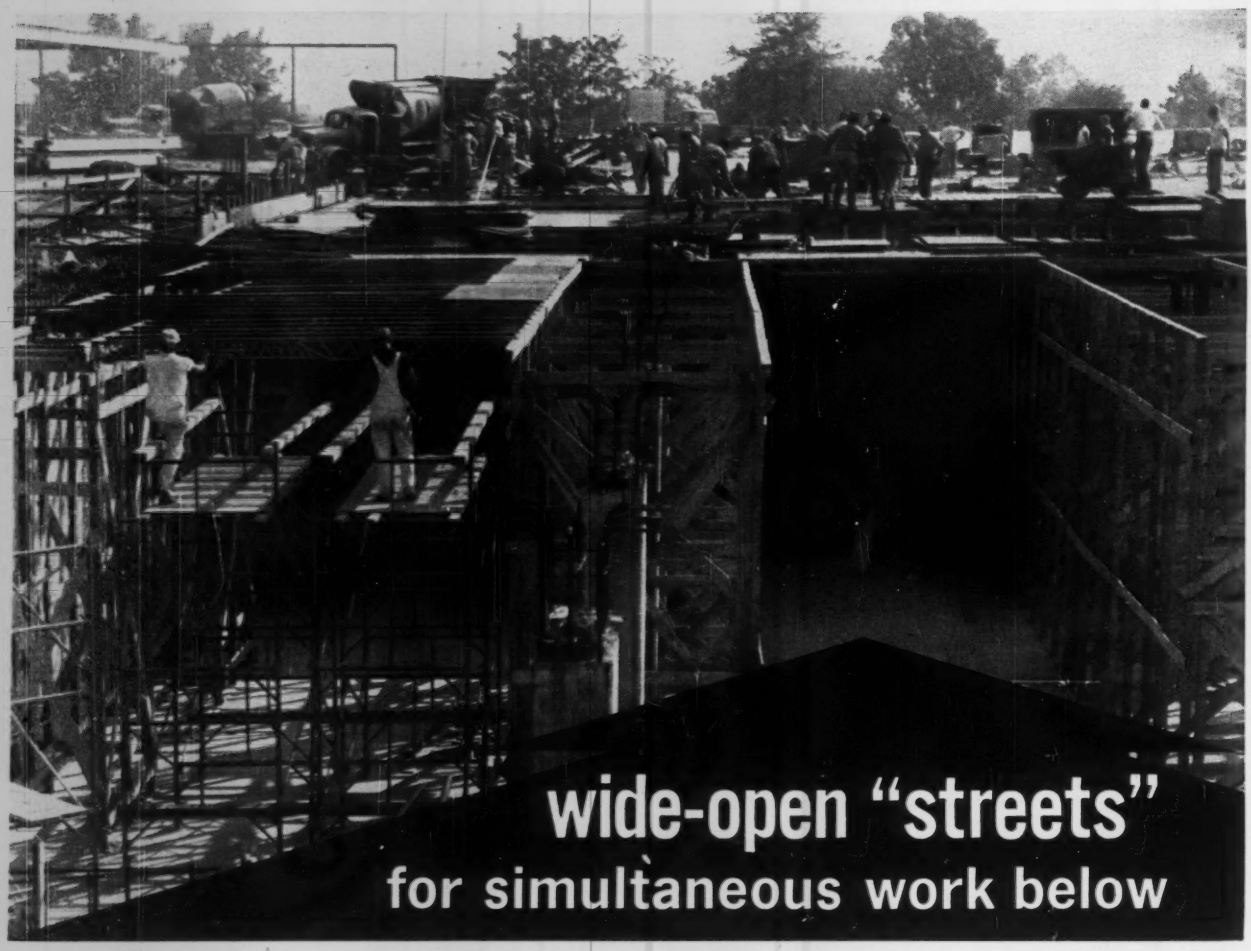
Interchangeable Speed-o-Matic clutches require little operator attention. Hydraulic-actuated cylinder pistons compensate automatically for normal lining wear, heat expansion or weather changes. There are no nuisance adjustments.

Twenty-five years of hydraulic manufacturing experience backs Speed-o-Matic; Link-Belt Speeder introduced the system in 1936. It is a modern product of the finest hydraulic shop in the shovel-crane industry. And all components (except pump) are made by Link-Belt Speeder. Get the complete Speed-o-Matic story from your distributor. Or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

107-61N

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder



...another reason why Rex-Spanall shoring speeded this job!

An interesting structure—the new $4,300,000 Federal Records Center, St. Louis. It's a half-million square feet big in space on two floors with several vaults. Over 25,000 cubic yards of reinforced concrete have been put in place.

The contractor applied many new ideas to its construction. For speed, greater safety and lowest possible shoring costs, Spanall was selected. This modern pre-engineered steel shoring with rapid adjustment provided foolproof, simplified erection.

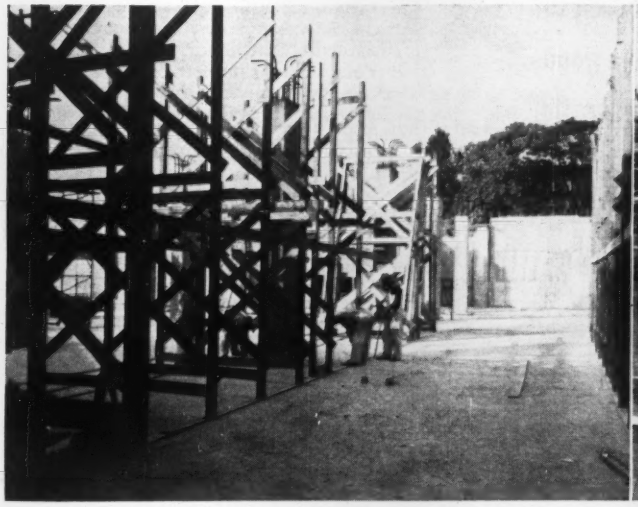
More than this, Spanall brought the *entire* job along faster. With wide-open spaces possible between vertical shores, these "streets" permitted easy, efficient movement of materials and allowed other workmen to hurry the job—all while concrete was poured above.

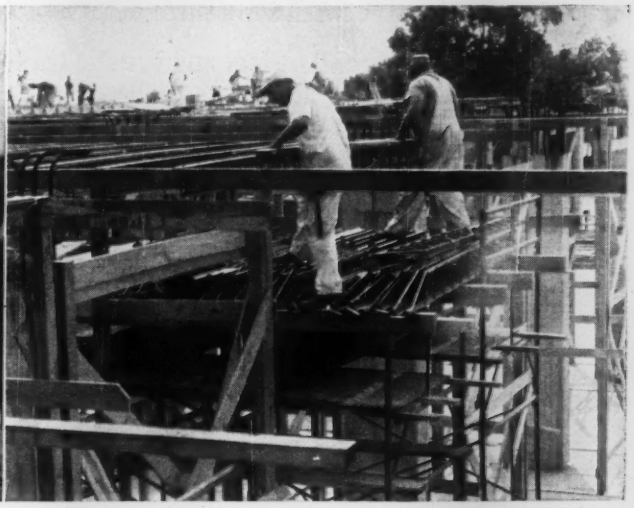
Project manager Louis Schwartz reported, "Spanall saved on shoring material expense to begin with, and then cut shoring costs substantially."

call your REX-SPANALL distributor...let shoring experts engineer your job

ARKANSAS: Finke & Williams, Inc., Little Rock • Lyons Machinery Co., Little Rock & Fort Smith • CALIFORNIA: Burke Concrete Accessories, Inc., San Francisco, Los Angeles, Oakland, San Bernardino, San Diego, Sacramento • COLORADO: K. C. Construction Supply Co., Inc., Denver • CONNECTICUT: Universal Builders Supply Co., Inc., New York • WASHINGTON, D.C.: Spanall of the Southeast, Inc., Alexandria, Va. • DELAWARE: Furnival Machinery Company, Philadelphia • FLORIDA: Southern Spanall, Inc., Fort Lauderdale, Winter Park • ILLINOIS: Rex-Spanall, Inc., Dolton; Missouri Construction Equipment Co., St. Louis • INDIANA: Moss Engineering Corporation, Fort Wayne; M. S. Churchman Co., Indianapolis; American Builders Supply Co., Louisville, Ky. • IOWA: Safway Steel Scaffolds of Omaha, Nebr. • KANSAS: Victor L. Phillips Co., Wichita • KENTUCKY: American Builders Supply Co., Louisville, Lexington • LOUISIANA: H. S. Finke Corporation, New Orleans • MAINE: Universal Builders Supply Co., Inc., Framingham, Mass. • MASSACHUSETTS: Universal Builders Supply Co., Inc., Framingham • MARYLAND: Spanall of the Southeast, Inc., Alexandria, Va. • MICHIGAN: Safway Steel Scaffolds, Inc., Detroit; Metal Building Specialties Co., Kalamazoo, Grand Rapids, Lansing • MINNESOTA: The Zeco Company, Minneapolis, Duluth, Hibbing • MISSOURI: Victor L. Phillips Co., Kansas City; Missouri Construction Machinery Co., St. Louis • NEBRASKA: Safway Steel Scaffolds of Omaha • NEVADA: Burke Concrete Accessories, Inc., San Francisco • NEW HAMPSHIRE: Universal Builders Supply Co., Inc., Framingham, Mass. • NEW JERSEY: Universal Builders Supply Co., Inc., New York; Furnival Machinery Co., Philadelphia • NEW MEXICO: K. C. Construction Supply Co., Denver, Colo.; Burke Concrete Accessories, Inc., Albuquerque • NEW YORK: Universal Builders Supply Co., Inc., New York, Syracuse • NORTH CAROLINA: Spanall of the Southeast, Inc., Durham • NORTH DAKOTA: Midwest Equipment Company, Bismarck, William O. Shirley Co., Fargo • OKLAHOMA: Victor L. Phillips Co., Oklahoma City, Tulsa • OHIO: Safway Steel Scaffolds, Inc., Cleveland, Toledo; E. W. Harman Company, Columbus; F. E. Longstreth Company, Dayton; Durbrow-Otte Associates, Inc., Cincinnati • OREGON: Burke Concrete Accessories, Inc., Portland • PENNSYLVANIA: Furnival Machinery Company, Philadelphia, Harrisburg, New Philadelphia; Dravo-Doyle Company, Pittsburgh • RHODE ISLAND: Universal Builders Supply Co., Inc., Framingham, Mass. • SOUTH CAROLINA: Spanall of the Southeast, Inc., Durham, N. C. • TENNESSEE: Finke & Williams, Inc., Memphis; Wilson-Weesner-Wilkinson Co., Inc., Nashville, Knoxville • TEXAS: Dixie Form and Steel Company, San Antonio • UTAH: K. C. Construction Supply Co., Denver, Colo. • VERMONT: Universal Builders Supply Co., Inc., Framingham, Mass. • VIRGINIA: Spanall of the Southeast, Inc., Alexandria • WASHINGTON: Burke Concrete Accessories, Inc., Seattle • WEST VIRGINIA: Safway Steel Scaffolds, Inc., South Charleston; Dravo-Doyle, Pittsburgh, Pa. • WISCONSIN: Hunter Machinery Company, Inc., Milwaukee, Green Bay, Eau Claire.

JOB: Federal Records Center, St. Louis, for General Services Administration; MacDonald Construction Co., St. Louis, sponsoring contractor of McCarthy-MacDonald-Fruin & Colnon



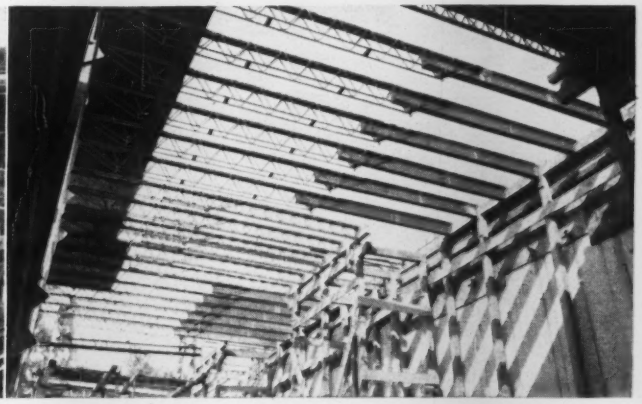


SMALL CREW sets bents for new area. Note wide "streets" which will be below long-spanning Spanall members. Other tradesmen will work here unhampered.

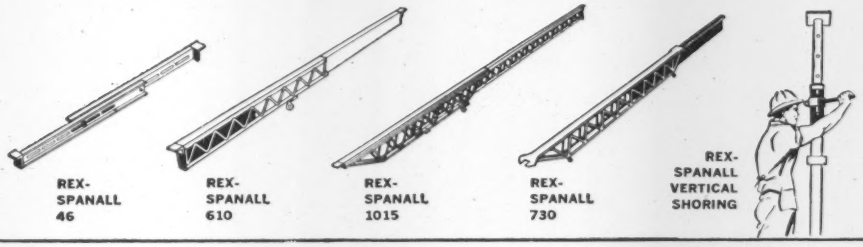
EASY UP! Just two men do rapid setting of Spanall shores. Working on a rolling platform, the Spanall members are lifted only a few feet from platform to ledger.

DECKING AND POURING RIGHT BEHIND. Job is ready for these operations in far less time with Spanall telescopic steel shoring having simple, single eyebolt adjustment. Spanall is removed and reset with ease as pours progress.

"WORK MATERIALS MOVE FREELY; you don't have all those forms. You could drive a truck under the floor we're pouring," project manager says of Spanall. Wide open space below, shown here, illustrates his point.



REX-SPANALL—what you need, when you want it, rental or sales



REX-SPANALL 46 | **REX-SPANALL 610** | **REX-SPANALL 1015** | **REX-SPANALL 730** | **REX-SPANALL VERTICAL SHORING**

REX®

SPANALL

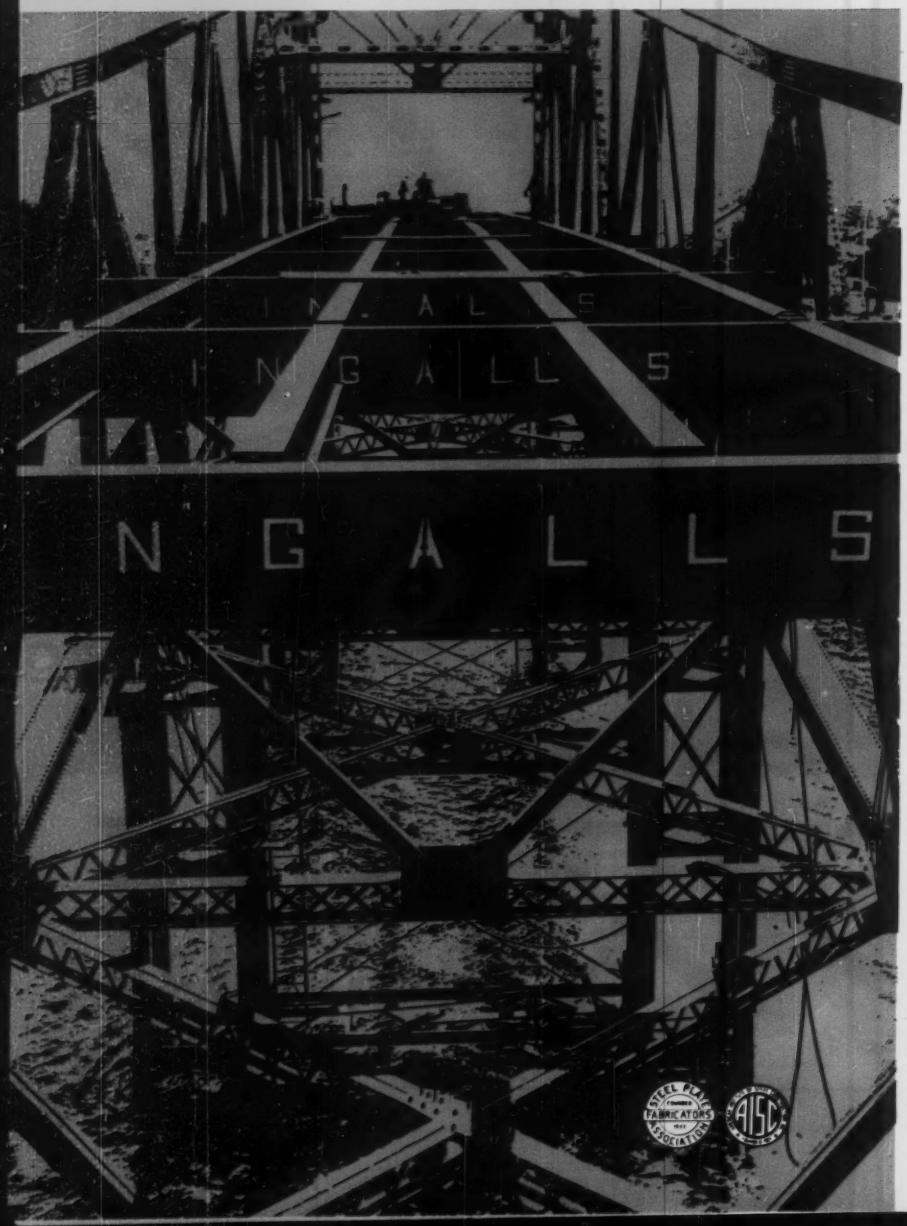
Subsidiary of CHAIN Belt Company, Rex-Spanall, Inc., 6427 West Capitol Drive, Milwaukee 16, Wisconsin. Export: Rex-Spanall International, S.A., Santurce, Puerto Rico

NO BUILT-IN OBSOLESCENCE HERE!

This bridge is being built to last . . . with a backbone of steel. Time-tested steel for strength, durability, and dependability. And it's being built fast . . . with structural steel fabricated to exact specifications by Ingalls. Steel and Ingalls make a good connection. Plan with steel on your next job – call in Ingalls for skill, versatility, and economy in fabrication and erection.

The Ingalls Iron Works Company / Birmingham, Alabama

INGALLS



. . . Reader Comment

in four widely separated areas, two of which are off-continent.

A special compact coordinating unit was established in the office of the architect-engineer to insure essential feedback and coordination of design with construction activities.

Your editorial indicated that the success in accomplishing missile base design and construction involved attitude and an appreciation of the vital importance of the new defense facilities. To this I heartily agree.

Additional ingredients necessary to insure satisfactory results are expeditious actions when required; proper and concerted coordination; and mutual cooperation of all offices in any program.

The above ingredients have been evident in the Nike Zeus Program and have produced results which are very favorable.

G. B. WESTON
Chief, Engineering Division
Mobile District
U. S. Army, Corps of Engineers
Mobile, Ala.

Editor's Note: For more about Nike Zeus construction see ENR Mar. 30, p. 20.

O.K., M-K

SIR—In your article on Iran (ENR Mar. 9, p. 36) some amplification should be applied to the statement: "It was an M-K report made for Iran back in 1946, in connection with a program for which World Bank loans were to be sought, that led into the formation of the Plan Organization." Actually, the report was prepared by International Engineering Co., Inc., for Morrison-Knudsen International Co., Inc. Both of these compaines are fully-owned subsidiaries of Morrison-Knudsen Company, Inc.

LYMAN D. WILBUR
Vice President
Morrison-Knudsen Co., Inc.
San Francisco, Calif.

For Your Calendar . . .

American Society of Planning Officials, national planning conference, Denver Hilton Hotel, Denver, Colo., Apr. 30-May 4. Write: ASPO, 1313 E. 60th St., Chicago 37, Ill.

National Building Material Distributors Association, annual spring convention, Biltmore Hotel, New York City, May 1-3. Write: S. M. Van Kirk, 22 W. Monroe St., Chicago 3, Ill.

American Institute of Steel Construction, annual national engineering conference, Hotel Leamington, Minneapolis, Minn., May 11-12. Write: AISC, 101 Park Ave., N. Y. 17, N. Y.

Building Research Institute, spring conference, Shoreham Hotel, Washington, D. C., May 16-18. Write: Building Research Institute, 2101 Constitution Ave., Washington 25, D. C.

American Society of Mechanical Engineers, design engineering conference and show, Cobo Hall, Detroit, Mich., May 22-25. Write: ASME Meetings Dept., 29 W. 39th St., N. Y. 18, N. Y.

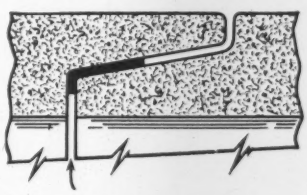
There's a quick-coupling, leak-proof, acid-resistant

TYLOX® *flexible* GASKET

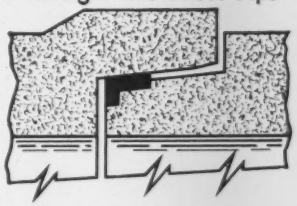
for any type of concrete pipe sewer line you plan or build

Are your files up to date on the *full line* of Hamilton Kent TYLOX Gaskets? Whether you are planning lines using T & G, B & S, Offset or Recessed Pipe, there's a special TYLOX true compression Gasket, in either rubber or neoprene, to assure fast pipe-laying and make the joints water-tight and acid-resistant for the life of the pipe itself. Check this list, and write for the TYLOX Data Brochures needed to make your reference files complete:

TYPE "C" and "C-P" TYLOX for Straight and Offset Pipe

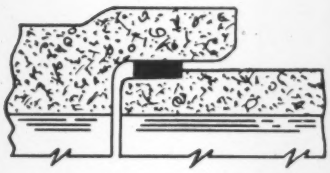


Type "C" Tylox under full compression. Note the visual inspection feature.



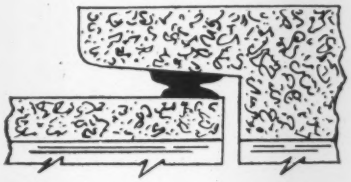
Type "C-P" Tylox under full compression. Flanges "lock" Gasket in proper position on the pipe offset.

TYPE "CR" TYLOX For Offset Pipe



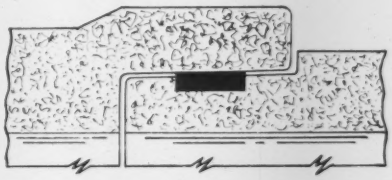
Type "CR" Tylox under full compression on single offset pipe.

TYPE "K" REXON for all types of B & S Pipe



Rexon "K" under full compression. Types available for both heavy and light duty service.

TYPE "CR" TYLOX (for Recessed Pipe)



Tylox Type "CR" under full compression. Wide, flat design makes "CR" roll and twist-proof.

USE THIS COUPON TO WRITE FOR MORE INFORMATION ▼

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Please send data brochures on the following Tylox Gaskets:
Type "A" ☐ Type "C and C-P" ☐ Type "K" Rexon ☐
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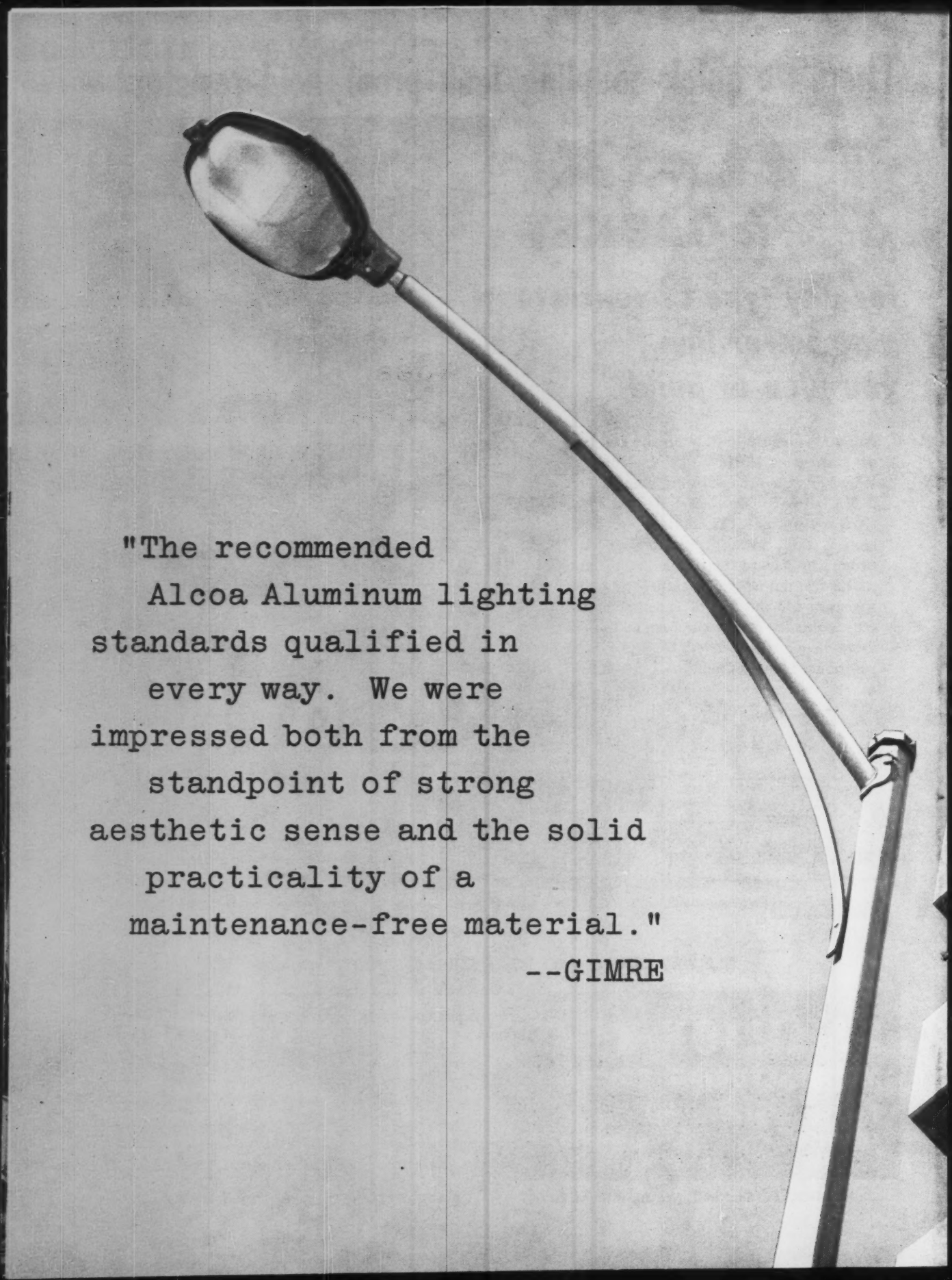
NORTHWEST: Seattle 1, Wash., MUtual 2-7667 • CANADA: Cooksville, Ont., ATwater 9-3671



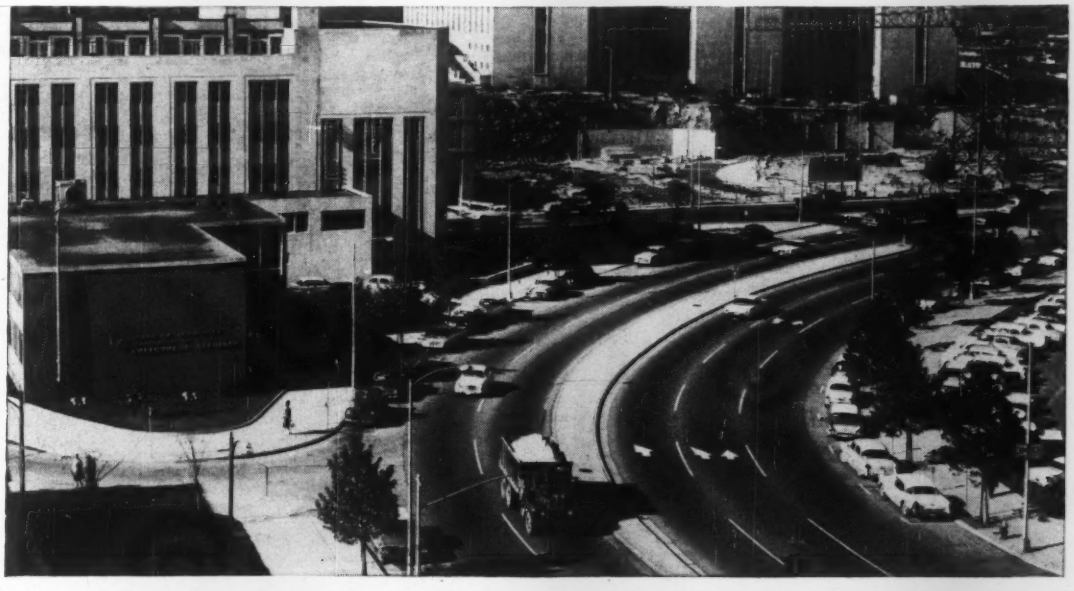
"The recommended Alcoa Aluminum lighting standards qualified in every way. We were impressed both from the standpoint of strong aesthetic sense and the solid practicality of a maintenance-free material."

--GIMRE

On left: GERALD GIMRE, Executive Director of the Nashville Housing Authority. On right: JOHN E. ACUFF, JR., Technical Director of the Nashville Housing Authority.

"Illumination is superb. The aluminum standards themselves reflect the happy combination of good design and strength in a maintenance-free material."

--ACUFF



URBAN RENEWAL in Nashville, Tenn. The Nashville Housing Authority, in cooperation with the city government, is replanning, redeveloping and conserving this capital city in five areas. Starting in 1952, the Capitol Hill area was the first redevelopment target and is now nearing completion.

"There is much to be said for aluminum in this area of maintenance. The consulting engineering firm employed by the Nashville Housing Authority recommended the Alcoa Aluminum lighting standards which you see in the Capitol Hill area —recommended them both from the standpoint of no maintenance as well as beauty."—ACUFF

For experienced help with street lighting and street signs in your urban renewal program, write: Aluminum Company of America, 895-D Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

HIGHWAY PRODUCTS

"We finished 60 days earlier with Zeecon"

Lee Tower, a 22-story office building built in Los Angeles after lifting of height restrictions. Architects: D. Everett Lee & W. Douglas Lee; Structural Engineers: Brandow & Johnston; Contractor: W. Douglas Lee Co., Inc.; Concrete Supplier: Beverly Building Materials Co., Beverly Hills; Concrete Admixture: "Econo-Mix" by Super Concrete Emulsions, Ltd., Los Angeles.

Read how Zeecon made this building stronger and easier to construct:

"By using Econo-Mix, we were able to strip forms in 3 to 5 days, instead of the usual 10," says Contractor W. Douglas Lee. Econo-Mix is a concrete admixture containing Crown Zellerbach's Zeecon, a controlled dispersant.

"The building was ready at least 60 days earlier than it would have been without the admixture, saving $30,000 interest on our financing alone. Finishers were able to start and finish during regular hours, cutting down on costly overtime. Moreover, the Econo-Mix actually paid for itself. We saved at least a half sack or more of cement per cubic yard of concrete.

"COMPRESSIVE STRENGTH was well above the 3000 psi requirements.

"WATER REQUIREMENTS WERE REDUCED 10 to 15%, making the concrete strong and dense. Yet workability was excellent."

For your next job we urge you to consider the advantages of admixtures containing Zeecon. Formulations are available in set-retarding or non-retarding grades, and with or without added air entrainment in some areas.

CROWN ZELLERBACH

Chemical Products Division

Camas 3, Washington

For additional Zeecon information, write to your nearest formulator or to Crown Zellerbach.

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Econo-Mix
Super Concrete Emulsions, Ltd.,
1372 East 15th St., Los Angeles, California

CONEX
Wescon Products, Ltd.,
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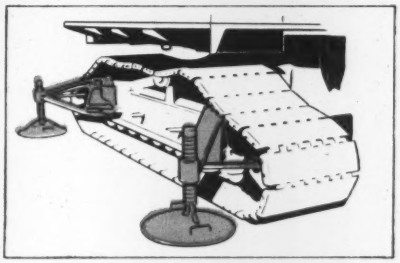
SAVE $$$ THOUSANDS!



Outriggers pivot into place. You get a big, square, firm foundation for lifts to 90,000 lbs. With outriggers tucked away, you can lift and walk with loads over 40 tons!

KOEHRING 545 SPRAWLER LIFTS AS MUCH AS OTHER MACHINES COSTING UP TO $20,000 MORE

The Koehring 545 Sprawler lifts an amazing 90,000 pounds. And it actually costs $20,000 less than 2 and 2½-yd. machines in the same range of lift capacity.

Don't raise an eyebrow. It's a fact. Your Koehring distributor can prove it and will welcome the opportunity to show you these figures in detail.

Another astonishing fact — Sprawler, is smaller in size. Moves from job to job faster, easier . . . takes less time to ready for work and travel.

From the ground up, Sprawler is truly something special. Its unique one-piece carbody, long, wide crawlers, and pivoting outriggers resist torsional strains at every working angle . . . enable Sprawler to outlift its own working weight by 14%!!

See your distributor about the 545 Sprawler . . . and the companion 330 Sprawler that gives you comparable cost-saving features. See him today!

K104

KOEHRING MEANS HEAVY DUTY

KOEHRING

DIVISION OF KOEHRING COMPANY

Milwaukee 16, Wisconsin

From Cows to Cars in Boston Common

Owner: Massachusetts Parking Authority; George Lewis Brody, Chairman
General Contractor: The Foundation Company, New York, N. Y.
Pumping Contractor: American Dewatering Corporation, Rockaway, N. J.

Boston Common is historic ground. Massachusetts was but a colony when this land was set aside in 1634 for a "trayning field" and the "feeding of cattell". For many years both Colonial troops and cows were customary sights on the Common.

During the Revolution the Common became a rallying point for patriots, and it has continued to be a meeting spot for free men and a center for free speech. Many great celebrations have been held here. Folks long forgotten, and folks long to be remembered, alike have made use of the Common.

Now the Common is entering a new era of use. Upon its site the city is building an underground garage which will provide parking space for thousands of the cars that enter Boston daily. To enable work to be done efficiently and "in the dry", Moretrench wellpoints keep 31 feet of water under constant control.

The Common's surface has been removed only temporarily, and when the garage is roofed over, trees, shrubs and turf will be restored to their original places. The Common will continue to have its familiar and historic look. It will only have deepened in its use to people.

Pumping is our business. You profit from our experience when you work with Moretrench — in the dry.

Moretrench Corporation

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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in the Applied Science & Technology Index, Business Periodicals Index and the Engineering Index.*

THE CONSTRUCTION WEEK

MICHIGAN LIKES MACKIE—Michigan voters not only reelected John C. Mackie as State Highway Commissioner, but they gave him more votes than any other candidate on the slate for any state office. Mr. Mackie, the only elected highway department chief in the country, will be on his second four-year term.

MIT MAKES IT A CENTURY—The Massachusetts Institute of Technology is celebrating its centennial this week with seminars on education of scientists and engineers and with a blue ribbon list of guest speakers. Heading the list: Britain's Prime Minister Harold B. Macmillan and U.S. Secretary of State Dean Rusk (see p. 200).

CONTRACTOR EXPANDS—J. A. Jones Construction Co., Inc. of Charlotte, N. C., last week bought Chas. H. Tomkins Co. of Washington, D. C. Purchase price was not disclosed. Tomkins' headquarters in Washington will become Jones' operating division and Washington branch. The Tomkins balance sheet for Dec. 31, 1960 shows capital and surplus at $3.6 million and work under way at $58 million.

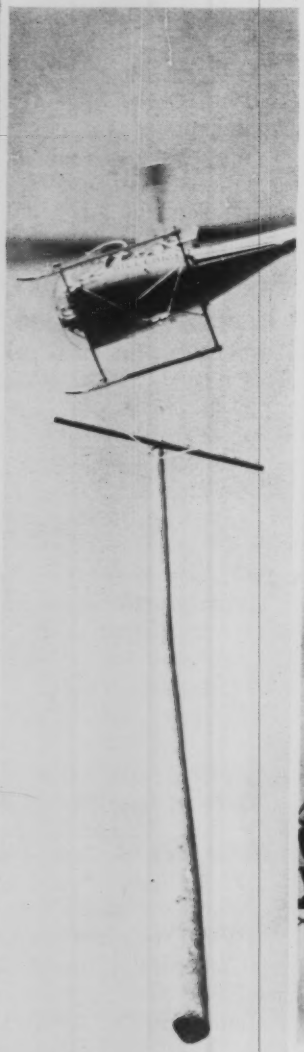
NO-STRIKE PACT?—The Associated General Contractors hopes to announce this month the successful negotiation of some kind of no-strike formula with seven basic construction trade unions. Since talks are continuing, everyone is mum about specifics, but this much is known: The unions and AGC's labor policy committee heard an encouraging progress report at a meeting in Washington last week. There are, however, some important legal questions still unresolved.

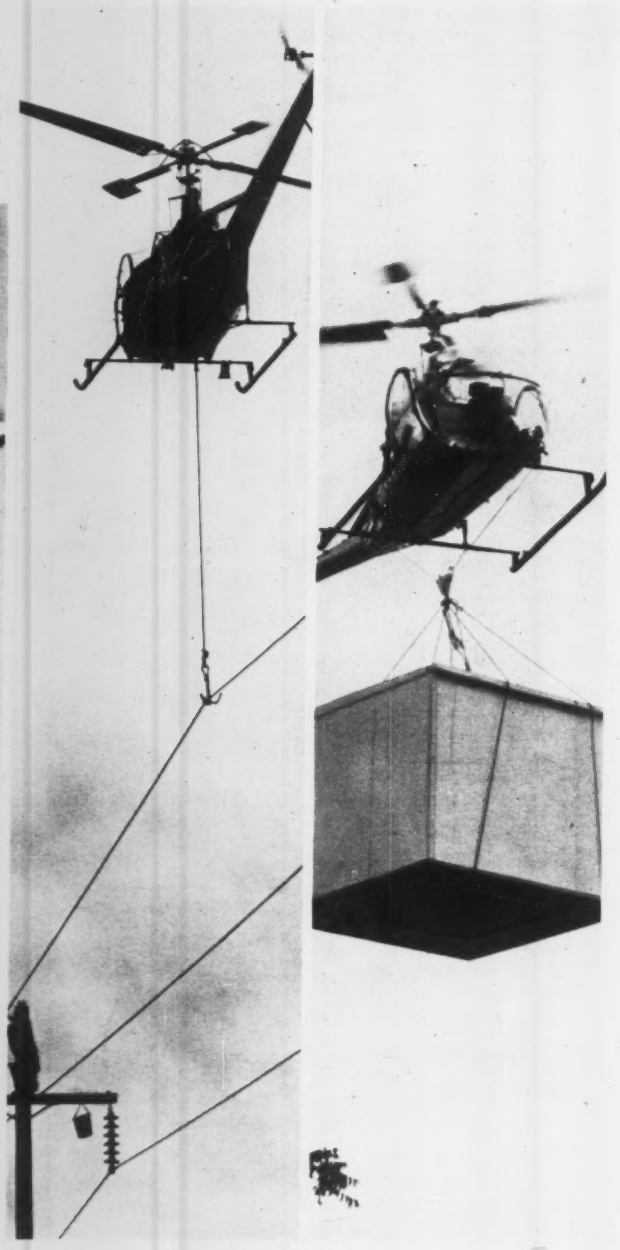
BIRD'S EYE VIEW—Prospective exhibitors at the New York World's Fair will be able to look over building sites from atop a 50-ft-high steel observation tower. When the tower has outlived its usefulness, the Fair Corp. will replace it with the theme for the fair—a 120-ft globe representing the earth and man-made satellites (ENR Feb. 23, p. 26).

SAN DIEGO ACTS ON SEWERAGE—San Diego's City Council is meeting this week to shift the city's $50-million sewerage construction program into high gear. The city will have 10 bid openings between mid-May and July. First contract awards and sale of a $42.5-million bond issue are scheduled for June 6.

HIGHWAY ADMINISTRATION EN MASSE—Gov. Terry Sanford of North Carolina is supporting a bill to increase the number of highway commissioners from seven to 19, including a full-time chairman. Not only would each of the 14 divisions of the highway department have its own commissioner, but there would be a specialist in federal aid, one on ferries and two "commissioners at large."

Send for the new Hiller brochure, "On Target," the latest, most comprehensive guide to helicopters in missile site support. ***Contact: Hiller Sales Manager, Hiller Aircraft Corp., Palo Alto, Calif.***





POWER TO CLIMB . . . TO CARRY . . . TO PULL . . . TO LIFT . . . IS BASIC TO HELICOPTER PERFORMANCE. POWER TO PULL OUT OF TIGHT SPOTS – STRAIGHT UP AND FAST – IS BASIC, TOO, TO HELICOPTER SAFETY. IT MAKES SENSE, THEN, FOR MEN IN MISSILE SITE CONSTRUCTION AND SUPPORT TO CONSULT HILLER, MANUFACTURER OF THE 12 E AND E4 – MODERN PERFORMING, FIELD PROVEN HELICOPTERS WITH MORE USABLE POWER THAN ANY OTHERS IN THEIR CLASS. THE HILLER E4, FOR EXAMPLE, IS THE ONLY FOUR-PLACE HELICOPTER WITH THE SAFETY RESERVE OF POWER TO CLIMB – STRAIGHT UP – FULLY LOADED – AND AT A SPEED OF 820 FEET PER MINUTE.

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SUBSIDIARY OF THE ELECTRIC AUTOLITE COMPANY

WASHINGTON OBSERVER

- Corps candidates narrow down
- Symposium on base building
- Minimum wage test coming

- **Maj. Gen. R. J. Flemming, Jr. is front-runner for Chief of the Army Corps of Engineers.** But the wind currents in Washington are pretty tricky and General Flemming may be left as Division Engineer in the Southwest when a successor to Lt. Gen. Emerson C. Itschner is named in the next week or two.

  Other possibilities submitted to the White House by Army Secretary Elvis J. Stahr, Jr. include major generals Walter K. Wilson, Jr., William A. Carter, William F. Cassidy and Thomas A. Lane. The Army Selection Board is reported to have ruled out major generals Keith Barney, acting chief, and G. E. Galloway, because they are too close to retirement age.

  Contractors are doing a good bit of behind-the-scenes politicking to get a strong man named as Chief of Engineers. Many of them feel that government civilian and military construction programs have lost ground through abdication of authority by the Corps in recent years. The latest case in point is the mingling of job authority with the Air Force on missile base construction.

—

- **All aspects of missile base construction will get a thorough airing at an Air Force symposium next week.** Maj. Gen. Thomas P. Gerrity, commander of the new Air Force Ballistic Systems Division, has invited 168 industry people to an all-day session at Los Angeles April 19. In attendance will be about 75 general and specialty contractors as well as missile manufacturers and representatives of industry associations.

  Consolidation of Air Force and Army Engineer responsibilities for base construction is taking more time than had been expected. The Air Force had hoped to work out a unified setup by April 1. But final decisions apparently will have to await more of the conferences that are going on daily at Los Angeles headquarters.

—

- **The Administration's minimum wage proposals are due for another test in the Senate within a few days.** The bill, sponsored by Sen. Pat McNamara (D., Mich.) would raise the minimum wage to $1.25 an hour for some one-million construction workers employed by firms doing a $350,000 annual business volume.

  The House knocked this construction feature out of the bill and reduced the minimum wage to $1.15 an hour. If the Senate approves the Administration version (as seems likely), the matter will have to be settled in a House-Senate conference committee.

—

- **President Kennedy's plan to create a Department of Urban Affairs will run into trouble in Congress** if he insists on naming Robert C. Weaver, a Negro, to the new Cabinet post. That was the original idea when Mr. Weaver became head of the Housing and Home Finance Agency. Word is out now that Mr. Kennedy may bow to congressional pressure and name Mayor Richardson Dilworth of Philadelphia, to the post.

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ENR asks: Would advance aid speed highway work?

CALIFORNIA - LIFTING OF CURRENT RESTRICTIONS WOULD EXPEDITE CALLS FOR BIDS

OHIO - WE HAVE A RESERVE OF PLANS AVAILABLE, AWAITING FEDERAL FUNDS

SOUTH CAROLINA - UNLESS FUNDS ARE RELEASED, ADVERTISEMENTS WILL BE DELAYED

NEBRASKA - DELAYS IN ACQUIRING RIGHTS-OF-WAY LIMIT CONTRACTING RATE

TENNESSEE - MORE PAVING COULD BE LET FOR SUMMER AND FALL CONSTRUCTION

FLORIDA - AVAILABILITY OF STATE MATCHING FUNDS LIMITS CONTRACT AWARDS

32 Highway Departments Say 'Yes'

Six of the seven largest roadbuilding states—California, Ohio, New York, Illinois, Texas and Pennsylvania—would be able to step up contract awards if contract controls are lifted to allow early obligation of federal-aid funds for 1962.

The seventh state—Michigan—is bonding in advance of federal aid to go ahead with an accelerated highway program. Early release of '62 funds would not change Michigan's rate of contract awards, but would somewhat decrease bonding requirements.

These seven states plan to award more than $1.8 billion in construction contracts during 1961. That's 40% of the anticipated total of contract awards for all 50 states, Puerto Rico and the District of Columbia.

Funds for 1962 normally will not become available until July 1 although they were apportioned several months ago (ENR Aug. 4, 1960, p. 23).

A key question in a just-completed ENR survey was this: "Can your state highway department advertise for bids earlier on its 1961 contracting program if fiscal '62 federal aid is released in advance of the normal quarterly obligation schedule?"

The answer from 32 states and the District of Columbia: "Yes."

Contract plans of these state highway departments add up to more than 75% of the 1961 estimated total.

California replied: "Lifting of current restrictions would expedite calls for bids." Ohio has a "reserve of plans awaiting federal-aid finances." A recent increase in state funds in New York will permit continuation of the highway program at a peak level.

A slightly different view was expressed by a spokesman for South Carolina, who said: "Unless we obtain advance release of reimbursement obligations, advertisements for bids will be delayed."

If current restrictions were lifted in Tennessee, "more paving could be let for summer and fall construction." Mississippi highway officials say: "Full release of federal funds now would accelerate program tremendously."

Early release of 1962 funds could be translated into construction contracts quickly in most areas and would provide a sizable stimulus to the economy.

Each billion dollars of federal-aid highway work actually under construction generates on-site employment for about 48,000 men with a weekly payroll of about $4,650,000. These are figures from a Bureau of Public Roads report made in 1958.

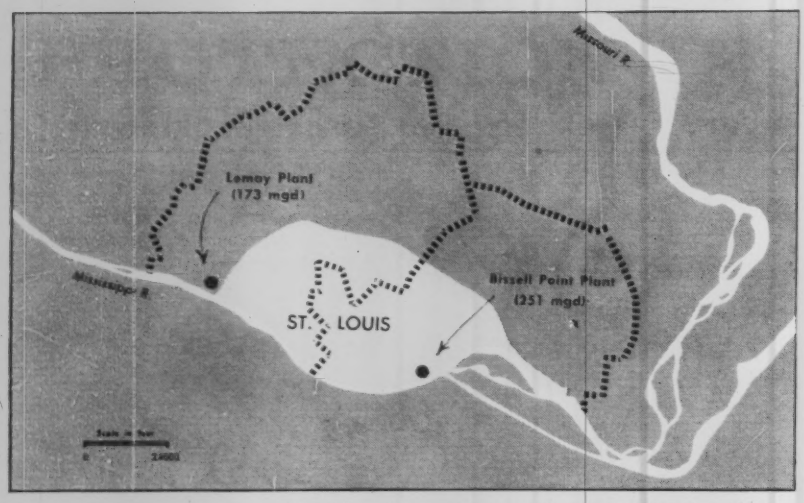
Of the working force, about 18,130 men are equipment operators, while 2,605 men service and repair equipment. Another 15,605 are unskilled laborers. The remaining 11,660 men are engaged in miscellaneous skilled and semi-skilled crafts and in professional, managerial, clerical and service occupations.

Highway construction also generates a sizable amount of off-site employment —at least as much and perhaps even more than the on-site employment.

Highway projects, of course, consume vast quantities of material—particularly steel, cement, aggregates, lumber and petroleum products. And they generally require accelerated buying of construction equipment and supplies.

Fifteen states and Puerto Rico replied "no" to ENR's question. Reasons for an individual state's inability to award contracts at a faster rate varied —delays due to right-of-way acquisition, incomplete plans, lack of state matching funds, litigation over condemnation and controversies over route location. Several states attributed delays to a shortage of engineers and slowness of the Bureau of Public Roads to approve plans for federal-aid projects.

But the most important factor seems to be delays in right-of-way acquisition.



New sewage plants and collection system priced at $100 million.

St. Louis' Water Pollution Cure

A two-year engineering study just completed for the Metropolitan Sewer District of St. Louis outlines a $95-million sewerage construction program to meet federal government demands on St. Louis in the Mississippi River pollution abatement campaign.

Recommended works include two big sewage treatment plants and extensive sewage interception and transmission systems.

The study concerns most of the Metropolitan Sewer District's service area but excludes two sections that drain into the Mississippi outside the district limits. The MSD area includes the entire City of St. Louis and much of suburban St. Louis County.

The consulting engineers set down a seven-year spending program totaling $94.7 million. They suggested a $105-million bond issue, however. The $10.3-million excess would accommodate possible delays in financing and construction.

The engineers forecast year-by-year engineering and construction outlays, assuming approval of a bond issue next year and completion of the major interception and treatment works by 1967, to be as follows:

1962	$ 2,494,000
1963	9,512,000
1964	30,208,000
1965	37,562,000
1966	8,375,000
1967	3,469,000
1968	3,049,000
Total	$94,669,000

Sewage would be treated at two plants, Bissell Point and Lemay, with a combined capacity of 424 mgd (million gal a day), the estimated 1985 average daily sewage flow. The plants could be expanded, both for greater flow and the later addition of secondary treatment facilities.

The initial plan calls only for conventional primary treatment: coarse screening, grit removal, comminution, preaeration, primary sedimentation, and chlorination of influent and effluent.

For sludge disposal, the engineers recommended vacuum filtration and incineration without digestion. They supported the recommendation with a conclusion that it would not be economically feasible to digest sludge and generate by-product electric power with the gas produced; and further that it would not be economical to produce fertilizer or soil conditioner from the digested primary sludge.

However, they recommended re-evaluating the feasibility of sludge digestion about 1980. And they recommended reserving space at both plant sites for future digestion facilities. Addition of secondary treatment, a future possibility, would greatly enhance the potential benefits of sludge digestion, they pointed out. Sludge digestion would be compatible with the presently proposed works.

The collecting system to feed the Lemay plant would consist of a number of pumping stations and pressure conduits. It also would include a future relief sewer in the River Des Peres channel.

The collecting system for the Bissell Point plant would consist mainly of deep tunnels in rock, fed by a number of pumping stations and pressure conduits.

The two treatment plants would differ little except for capacity. The Bissell Point plant's initial capacity of 251 mgd could be expanded to an ultimate capacity of 294 mgd as a secondary plant of the activated-sludge type. Lemay could be similarly expanded from 173 mgd to 221 mgd.

Other differences arise from topography. A major raw sewage pumping station would be located at Bissell Point. At Lemay the entire flow would be discharged to the plant through force mains. Plant effluent would have to be pumped into the river from Bissell Point at river stages above 32 ft. The Lemay plant would discharge entirely by gravity.

The report is the second—Report B—of four on pollution abatement in the portion of the Metropolitan Sewer District draining into the Mississippi within the district boundaries. (Other parts of the MSD service area drain into the Meramec and Missouri rivers and thence into the Mississippi at points outside the district.) Report A summarized basic data on quantity and quality of sewage and industrial wastes presently being discharged to the Mississippi River, predicted future waste quantity and characteristics, and developed criteria for interceptor and sewage treatment plant design. Report C deals with financing, operating and maintaining facilities. The first part of C, already completed, concerns the existing system; the second part will cover the works recommended in reports.

Report D, last of the series, will summarize the most important facets of the entire study.

Two consulting engineer firms—Horner & Shifrin, St. Louis; and Havens & Emerson, Cleveland—are making the studies.

Roads Job Decision Ends New Mexican Hat Dance

The confusion surrounding appointment of a chief engineer for the New Mexico Highway Department has apparently been resolved with the naming of T. B. White to fill the post.

Mr. White, a licensed professional engineer, had spent 33 years with the department and was deputy chief engineer in charge of location and design when he was forced into retirement in 1959 by an incoming Democratic majority on the Highway Commission.

This same majority forced the resignation of Lawrence D. Wilson, Republican-appointed chief engineer, who then became chief administrator for the Alaska Highway Department. The Democrats named D. B. Dixon to the top engineering job.

When Republicans recently regained control of the commission, they demoted Mr. Dixon and recalled Mr. Wilson.

Then the State Attorney General pointed out that Mr. Wilson's residence in Alaska could make his appointment illegal, so the commission reversed itself and named Mr. White.

One-piece lift raised 52,000-sq-ft roof about 12 ft to gain room for an added second floor.

New Floor Kicks Old Roof Upstairs

Upside-down lift-slab equipment has raised a 52,000-sq-ft roof to make room for a new floor purposely constructed too close to the ceiling of a store in Fairview Park, Ohio, near Cleveland.

The job, of course, made more sense than that to the designers and engineers charged with revamping a six-year-old building for Higbee Co., Cleveland's largest department store. The object was to put more floor space into a new suburban outlet of the store.

It meant first building the new level then raising the roof in one piece.

The steel framed truss roof measures 208 x 250 ft. Engineers working with 33 jacks through a single console lifted the 750-ton weight 11 ft 7 in. over a 12-hour period. New columns at the perimeter and original columns in the interior carried the roof up to its new position. The jacks were set under these columns and worked against their bottoms.

At the building perimeter, new columns were erected against the inside flange of existing supports and carried to the top outer gusset plates of the roof truss. The existing supports were cut near their tops and at the bottom chord truss connection. After lifting, the new column and old support were spliced, side by side, with an overlap of about 10 ft.

Pairs of temporary columns at interior supports carried the roof while jacks were installed under the old columns for the lifting operation.

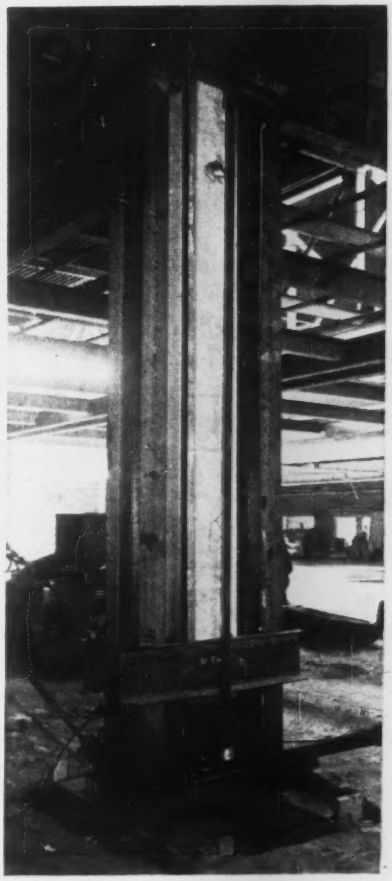
Screw rods for lifting the roof were hung from the new floor framing and the lifting gear crawled up the rods from the bottom—a switch on the more usual practice of top-mounted jacks with rods pulling the load up into position.

Before any lifting was done, steel crews moved inside the existing building and erected the new second floor, topping out the steel just 6¾ in. below the existing ceiling. Double girders framed into each side of the old exterior columns, leaving room between for the new columns, which would lift the roof. At existing interior columns, channel yokes tied the new steel to the temporary columns until new ground floor columns went into place after the lifting.

The original structure was air-conditioned with ducts running through the truss space. For the lift operation, main feeders at the mechanical room were cut and the entire works—roof plus ducts—went up. In the altered building, new feeders connect the mechanical equipment and duct system—now above the second floor. Air for the first floor goes down ducts from the roof through the second floor. Both the existing—but relocated—truss roof and first floor ceilings act as return air plenums.

Loewy-Snaith Corp., New York City is designer for the $6-million project. Strobel and Rongved, New York City, are consulting engineers.

Samuel W. Emerson Co., Cleveland, is the general contractor. Miller Lift Slab Co., Columbus, Ohio, handled the $24,000 roof raising operation. Paterson-Leitch Co., Cleveland, are the structural steel subcontractors.



LIFT SYSTEM depended on jacks crawling up rods hung from new floor steel.

Researchers show how computers are . . .

Figuring the Cost of Earthmoving Jobs

With the aid of digital computers you can predict the performance of earthmovers accurately even before they are built. You can use the same analytical method in evaluating the performance of existing tractor-scraper combinations.

This process of calculating the cost of moving a cubic yard of earth was presented at the 12th annual earthmoving industry conference in Peoria, Ill. last week. The conference is sponsored by the Central Illinois Section of the Society of Automotive Engineers.

Two research engineers of the Caterpillar Tractor Co., D. A. Lewis and W. C. Morgan, presented a step-by-step analysis of tractor-scraper performance.

The machine's performance is evaluated primarily on the cost of handling a cubic yard of material, using a power-to-weight ratio of the tractor-scraper combination that fits the average job conditions.

Basically, the cost-per-yard is the ratio of ownership and operating costs to earthmoving production. And production is the ratio of cubic yards hauled per trip to the scraper cycle time. Where pushers are used for loading, an additional factor of yards hauled per trip to pusher cycle time is also used.

The earthmoving cycle of the tractor-scraper—loading, hauling, dumping and returning—has 11 basic components. They include accelerating, running at top speed and braking on both the haul road and on the return road. They also include maneuvering in the borrow pit and on the fill.

In addition to the evaluation of these basics, the digital computer program is so flexible that many other variables can be examined in detail. These include the effect of delay time in shifting gears; rotary inertias of engine flywheel, gears and wheels in calculating acceleration of the machine; and the relationship of haul length to power-to-weight ratio.

The conference also heard a report on the future of nuclear explosives for excavation. G. W. Johnson, associate director, Lawrence Radiation Laboratory, University of California, said it will be several years before a workable method can be perfected. Moreover, it will not be practical to employ nuclear explosives to move less than 200,000 cu yd at a time, he said.

The cost per cubic yard of moving material with nuclear explosives would vary widely, depending on the size and type of excavation. In the case of floodwater diversion or disposal pits for waste materials, where the requirement is simply for a large hole, the estimated cost of blasting a 400-ft-dia crater, 90 ft deep and yielding 200,000 cu yd, would be $5.25 per cu yd. At the other extreme, it would cost only about $0.04 per cu yd to blast a 3,200-ft crater, 690 ft deep and yielding nearly 100 million cu yd.

Nuclear explosives may some day find practical applications in the construction of harbors and canals, Mr. Johnson said, but studies to date indicate that a sea-level canal in the Panama Canal Zone could not be constructed with nuclear explosives.

There would be too much danger from radioactive contamination and the material thrown out of the crater.

Land cost may zoom as . . .

Court Rules Friant Dam a Trespasser

In a decision that may have far-reaching effects on future federal water projects, the U. S. Court of Appeals in San Francisco has ruled that the Bureau of Reclamation's Friant Dam trespasses on water rights of downstream users.

The action upholds a 1957 injunction obtained by some farmers farther down the San Joaquin River. Under the injunction, unless the federal government formally acquires the trespassed water rights, it cannot operate Friant Dam without also maintaining 11 collapsible check dams that simulate full-stream flow for the downstream users.

Bureau of Reclamation officials in Sacramento, apparently disturbed by the decision, told ENR: "We may have to condemn water rights on a far broader scale than we did at Friant. . . . Or we may need special federal legislation to relieve us of the responsibility." Initial feeling was that cost of acquisition would skyrocket unless checked by legislation.

In essence the Appeals Court decision says:

- The government must be precise about what it takes when it acquires water rights by condemnation.
- When it is not precise, as was the case at Friant, downstream users have a legal gripe. The artificial changing of the river level infringes upon the water rights of those who refused to sign water delivery contracts with the government.
- The fact that the farmers in question received their water rights from the State of California doesn't curtail the federal government's power to acquire these rights through eminent domain or inverse condemnation in which they seize the water first.

This last provision opens the door for the U. S. Bureau of Reclamation to acquire the water rights. A spokesman for the farmers' group, while generally pleased with the decision, indicated that this last point may set off a new round of litigation in the 14-year-old case. "There is a serious legal question, regardless of how broad the government's power of condemnation may be, as to whether it can take irrigation water from one farmer and give it to another for the same purpose," he said.

The Bureau of Reclamation completed Friant Dam in 1942. It is part of the bureau's Central Valley Project. Friant's reservoir, Millerton Lake, waters wide areas of the highly cultivated Central Valley through two canals—Friant-Kern and Madera. The water is replaced 50 miles below Friant by Sacramento River water via the Delta-Mendota Canal.

In building the dam, the federal government signed water supply contracts with downstream users as well as with users who would draw water from canals in the distribution system.

Some downstream farmers, preferring the natural flow of the river, refused to sign such contracts and in 1947 filed suit charging that artificial lowering of the river level had deprived them of their state-granted riparian rights without compensation.

The court agreed: "A water right with no assurance of its peaceful enjoyment is worth little to a farmer whose very existence is dependent upon the predictability of his future water supply."

Forth River Bridge Towers Rise

Builders of the $44-million highway suspension bridge across Scotland's Firth of Forth have completed basic work on side span piers and are halfway through construction of the two 512-ft main towers (ENR Sept. 22, 1960, p. 146).

The new Forth highway bridge, with its 3,300-ft center span, will be Europe's longest suspension bridge. The length, including approaches, will be 1¼ miles. It will have a clearance of 150 ft above high water.

The main towers of the bridge are fabricated box sections built up from steel plate.

The bridge at right is the historic Firth of Forth railway bridge, completed in 1889. (A firth is a river estuary.)

Expressways Mesh at Four Levels

New York State Department of Public Works will let a contract April 27 for this four-level interchange between the Clearview Expressway and Grand Central Parkway on Long Island. The work will cost about $7 million.

The design takes advantage of the 70-ft difference in elevation between the two highways. The interchange will be located in Queens Borough, New York City.

Blauvelt Engineering Co., New York City consultants, designed the interchange.

Higher, Longer Breakwater Tseen as Tsunami Tshield

The port of Hilo, Hawaii's principal tsunami target, may soon get protective works to shield it from the destructive tidal waves caused by earthquakes. The Board of Engineers for Rivers and Harbors, a Corps of Engineers agency, recommends spending $26.5 million to extend the existing breakwater at Hilo and make it higher.

Tsunami—the geologic term for waves caused by seismic disturbances—have hit Hilo repeatedly over the years. The two most recent waves caused nearly $50 million in damage and 157 deaths. One struck in 1946, the other just last May (ENR June 9, 1960, p. 23).

The Corps' plan calls for increasing the height of the harbor's existing breakwater to 20 ft above sea level and extending it to enclose all but a 600-ft-wide entrance. The breakwater would also be extended 6,600 ft along the shoreline as a seawall.

The project involves building two rockfill barriers in the harbor, one 13,000 ft long and the other 4,000 ft long. The existing breakwater would be incorporated into the longer one, which will tie in with the seawall on the shore.

An alternate proposal to wall off the central area of the city was found to be cheaper than the breakwater plan, but it was scrapped because it left many areas unprotected.

Hawaii has already approved the breakwater plan. It would cost the state more than $5 million, the federal government just over $21 million.

A440 Steel Building Frame Saves Weight and $80,000

A 16-story office building frame designed in A440 steel (ENR June 6, 1960, p. 24) is estimated to cost $80,000 less than the cost of a comparable A7 steel frame. Weight saving totals 560 tons, or 20% less than an A7 steel frame.

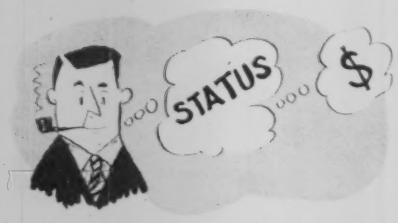
Andersen-Westfall Co., Inc., of Portland, Ore., submitted the low bid of $6.4 million for the general contract.

The greatest savings are in the columns, where the weight is cut 23%. Beams weigh 19% less than A7 beams designed for 20,000-psi basic stress.

A440 is a low alloy steel with a yield point of 50,000 psi—50% higher than A7 steel. The engineers designed the beams for working stresses of 30,000 psi. Floor beams spanning the 51-ft bays will be "split wide flanges," fabricated by welding spaced web plates between two tee sections. Spandrels will be welded, tapered sections.

Structural engineers are Cooper and Rosé of Portland. Architects are Skidmore, Owings and Merrill. Standard Insurance Co. of Portland is the owner.

The engineer looks at himself and finds . . .



He wants status more than money.

But good treatment should go with it.

He reads job ads with a grain of salt.

His Job Is a Pleasure, the Boss

An engineer is an unsettled man—dedicated to his work but not to the company he works for; jealous of management's prestige and critical of the job management does, but dimly aware that he is unsuited for management work; a searcher for higher professional and social status who sneers at the standard paths to such goals.

An engineer is an intelligent man but not intelligentsia. He finds deep satisfaction in solving knotty problems but pouts if he does not get proper recognition for the solution. He is a man who feels he is exploited by the people he works for.

These are some of the findings of a study made by Deutsch & Shea, manpower consultants, for use by recruiters and employers of engineering talent. The study, made at great depth with a small sample, was meant to be a pilot for a larger program, but the findings paralleled so closely the results of previous studies that the larger project was dropped. Deutsch & Shea found that the only significant change in engineers' attitudes in the past 10 years is the more sophisticated view they take of the utopias offered in the want ads for engineers.

The study, combining questionnaires and depth interviews, probed for the weak links in the relationship between engineers and management. Deutsch & Shea wanted to know what are the satisfactions that will make an engineer stay with a company, what are the incentives that will make him leave it and what are the attitudes of engineers toward mobility in jobs. To find out, they asked:

• **Are engineers by and large satisfied with their jobs?**—To a surprising extent they are not. According to the study, over a third of all engineers have feelings ranging from active dissatisfaction to "neutrality" about their jobs and only 17% of them are very satisfied with their present work.

The figures vary from company to company of course, but as a group, engineers seem disenchanted with their profession.

Many different reasons are given for their dissatisfaction, but what it boils down to is that all too many engineers feel under-utilized and underpaid. They want more demanding work and they want the responsibility, freedom, and recognition (in the form of prestige and money) that go with it. In short, they want to be considered and treated as professionals, not technicians.

Engineers receive their satisfaction from job challenge and recognition for well-done work. As befits professionals, engineers find their greatest pleasure in a difficult challenge—if they have the freedom to attack it as they see fit. Engineers are intensely work oriented and extremely eager to prove themselves.

Given an interesting assignment with freedom from tight supervision, a typical engineer will spend most of his waking hours dogging after it. Whether paid overtime or not, engineers are found to spend an average of 20 hours a week of their own time on company problems.

But doing a job well is only half an engineer's satisfaction with his job. The other half is receiving proper recognition for his work. Praise not tactfully given is as bad as none at all. And automatic raises aren't nearly as satisfying as raises given after a successful project.

A process or project named after its engineer, a chance to publish new findings or a chance to obtain a patent, these are the highest accolades an engineer can receive. They mean much more than an automatic raise or a pat on the head.

• **What makes an engineer change jobs?**—Well, money is the most important—but seldom the only—reason. Higher pay by itself won't lure an engineer to another job. It takes a combination of attractions—plus dissatisfaction with his present job. Besides more challenging work, attractions may come in the form of a better technical library in the new job, better cross-fertilization of ideas among different departments, working for a company with more prestige, better liaison between engineering staff and management, semi-private offices and reserved parking space, or a higher level of professional competence in co-workers.

Dissatisfactions usually stem from a negligent or patronizing attitude held by management. Engineers rightly believe that their work is vital to a company's success. They feel hurt then when treated capriciously by management.

Deutsch & Shea found that the most frequent complaints voiced by engineers are:

• Poor communication between management and the engineers, which results in leaving the engineers in the dark about what the company is up to.

• Unnecessary red tape, reports and paperwork.

Projects would be started, complained the engineers, and then dropped without explanation. Or sometimes management would want only some flashy idea or shoddy piece of hardware, but constantly call for interminable progress reports.

Worst of all, the engineers seldom saw evidence that the reports were even read. Why have a man, they reasoned, spend so much time writing down professional advice if the advice isn't heeded?

Deutsch & Shea conclude that underlying the communication wall between engineers and management is a conflicting value system. Management is motivated by a desire for a smooth-running, successful business organization. Engineers are moved by a curiosity about nature and a desire for

He is not cut out for paperwork.

a Pain

mastery of intellectual problems. When one tries to talk to the other in terms of his own values, he will not be understood.

• **Are engineers reluctant to change jobs?**—Engineers are under heavy pressures to change jobs (the best evidence of the opportunity to change jobs is the want ad section of the paper, which most engineers read regularly) but more than half the engineers feel that their co-workers are reluctant to move. They say that engineers are usually introverted, slow to make new friends; most of them are married and buying houses; and they are slow to give up the company's rewards for longevity.

Those who disagree say that competent engineers are not afraid to change; young engineers have to move to gain experience and older engineers have to move when they hit an advancement plateau.

But both sides feel that the way to grow is to go from company to company. Even though salaries and benefits are becoming standardized, the highest raises come with job changes. And other benefits are far from standardized. Growth potential may be better and such personal benefits as living conditions, cultural advantages, work conditions and the gain from learning new methods and making new friends in the profession can be very important.

The engineers' overwhelming acceptance of the axiom that the path to the top goes through several companies shows that they may be misjudging themselves on their own reluctance to change jobs.

Although Deutsch & Shea's study, "A New Look at Engineer Attitudes," was written for managers and recruiters of engineering talent, it may be of interest to engineers and may be obtained by sending $3.50 to Industrial Relations News, Inc., 230 West 41st St., New York 36, N. Y.

Around the World . . .

• **Steel design contest**—The American Institute of Steel Construction is conducting its second annual competition for awards to the best-looking building framed with structural steel. Deadline for entries: May 1 at 101 Park Ave., New York 17, N. Y.

• **Heavy letting**—Montana awarded more than $5.5 million worth of road construction contracts this month, a record sum for a single highway letting there.

• **Power for the 49th**—A proposed $499-million Alaskan hydro project—two dams and reservoirs and a 580,000-kw power plant—is economically feasible under a new Bureau of Reclamation plan. The project at Devil Canyon would produce low-cost power to spur growth of the Anchorage-Fairbanks area.

• **Civil defense, Niagara style**—Civil defense and state officials are considering a Niagara-Mohawk Power Corp. power tunnel under Niagara Falls, N. Y. as a possible bomb shelter. The hydraulic tunnel will be abandoned soon when the utility shuts down an old power plant.

• **Blue Ridge power**—West Virginia's Power Commission has authorized Virginia Electric & Power Co. to go ahead with a $150-million, 143-ft dam and 250,000 to 300,000-kw steam generating plant on the Stoney River, convenient to nearby coal fields.

• **Mistakes cause fatal slide**—A Soviet newspaper has blamed "mistakes" for a landslide that killed 145 people in Kiev on March 13. The accusation confirmed rumors that such an accident had occurred. The slide brought down one slope of a ravine that for years had been in the process of being filled with river silt. Houses and barracks part way down the slope were destroyed. Too much water had been allowed to collect in the ravine, the newspaper reported.

• **Two dams, one reservoir**—A construction start is due next month on the Two Rivers Reservoir Project near Roswell, N. M. The $5-million Corps of Engineers development involves two dams with a common reservoir. One is on the Rio Hondo, the other on a parallel tributary, the Rocky Arroyo. Completion is set for 1963.

• **Frontal assault**—Cincinnati is about to launch a 300-acre redevelopment program for light industry on the Ohio River water front. Thirteen self-sufficient superblocks will fill the site. Utilities and services—even emergency hospitals—will be included.

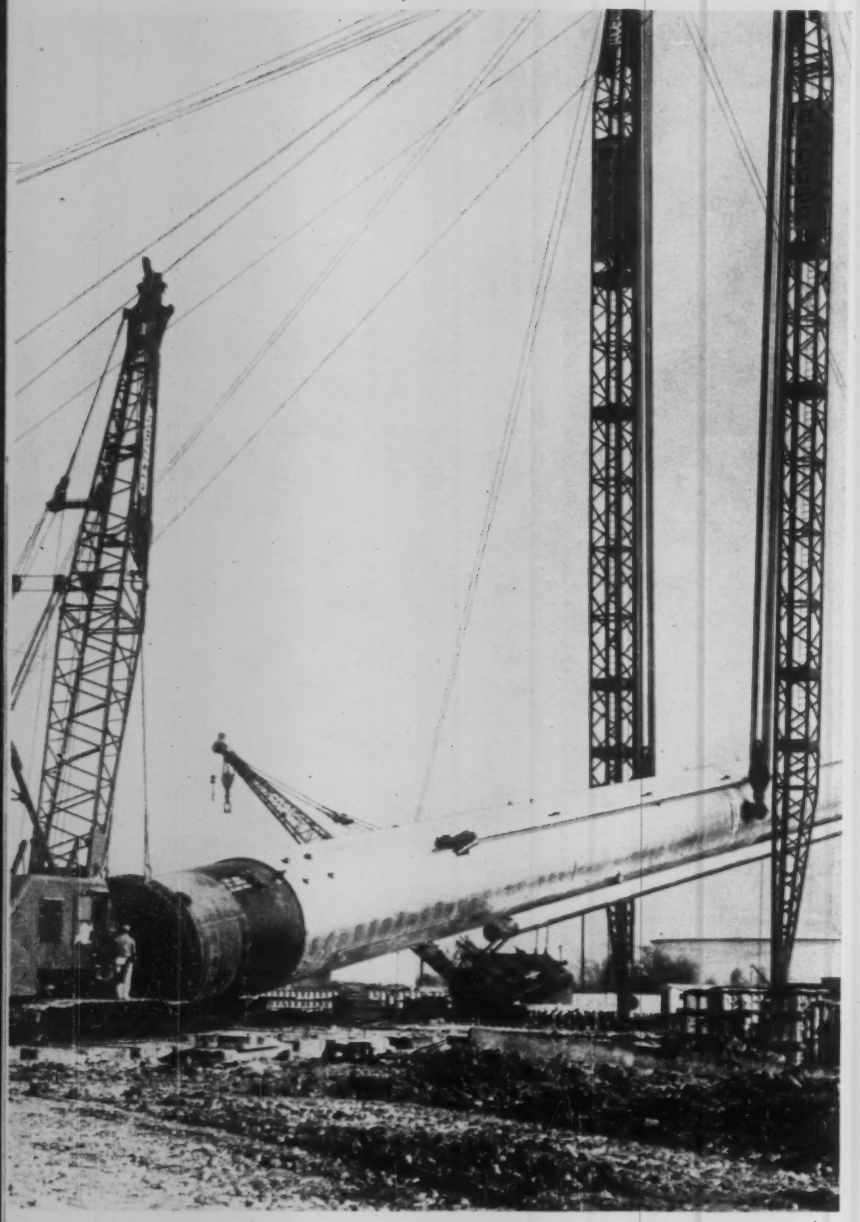
• **California drought?**—Unless the rains come and stay until late May, California will be hit by the greatest water shortage since 1931, says State Director of Water Resources, W. E. Warne. He predicts that irrigation water will be in particularly short supply in areas south of Sacramento and in the heavily farmed San Joaquin Valley.

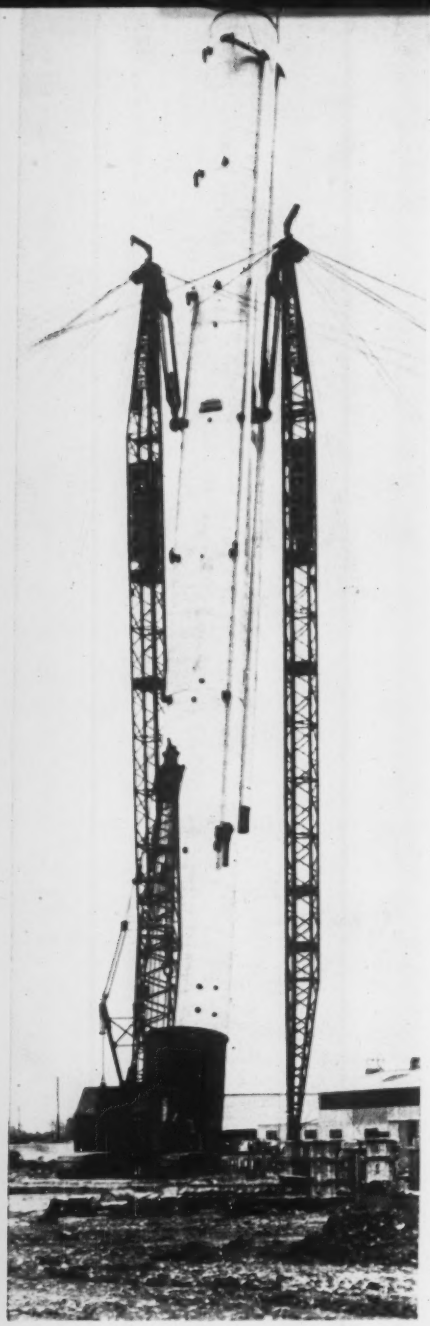
• **Three-way terminal**—The latest terminal building to rise at New York City's International Airport will house Northeast Airlines, Northwest Orient Airlines, and Braniff International Airways. Ten gate positions will go around the terminal perimeter rather than at extended finger positions. Present plans call for construction to be completed by mid-1962.

• **Build or else**—"Intolerable traffic conditions" will exist on Wilmington's Delaware Memorial Bridge by 1965, unless construction begins this year on a new bridge next to it, warns Enoch R. Needles, partner in Howard, Needles, Tammen and Bergendoff, New York consultants. The $100-million bridge has been in the planning stage for several years.

• **Prestressed reservoir**—World's largest prestressed concrete reservoir—28 million gallons—will be built in Snohomish County, Wash., for the Alderwood Water District. The $600,000 tank will take the record from two 15.5-million gallon tanks in Springfield, Mass. Preload Co., Inc., of New York will prestress the 370-ft-dia tank by wire-wrapping its 27½-ft-high walls. Rasmussen & B-E-C-K, and Gray & Osborne, both of Seattle, are general contractor and consulting engineer.

• **New Belgian tie-up**—New York City's Department of Marine and Aviation will build a $6.2-million quay-type wharf on Manhattan's East River water front for lease to the Belgian Line. The 1,470-ft wharf will provide berthing and working space for three cargo ships simultaneously.





Gin Poles, Crane Make a Record Lift

They started lifting at 8:30 a.m. and by 3:30 p.m. they had turned down the last anchor bolt. The lift—300 tons—was a 227-ft-long fractionating column for a styrene plant near Houston. The contractor claims it's a record for combined weight and size.

The tower—one of eight for the plant—is so big that shop crews had to build it in the direction it would take on arrival at the job. Six flatcars transported the column to the site. There, two 100-ton cranes lifted first one end then the other from the flatcars onto the tracks—converted tank undercarriages—which shifted it into position across its foundation.

The tower foundation kept a fleet of 45 six-yard trucks hustling an entire day. After two cranes, four buckets and a gang of laborers with chutes finished their work, the monolithic pad had swallowed up nearly 1,600 cu yd of concrete.

Twin 170-ft-high gin poles erected close to the horizontal column raised it into position on the foundation. Picking points on the column sides were set far enough above the center of gravity to let the column swing upright as it rose.

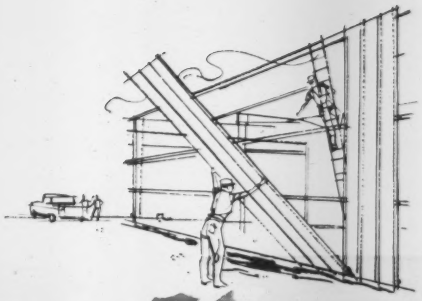
A crawler crane lifted the base clear of the ground and then walked the column toward the foundation pad as hoist engineers raised it.

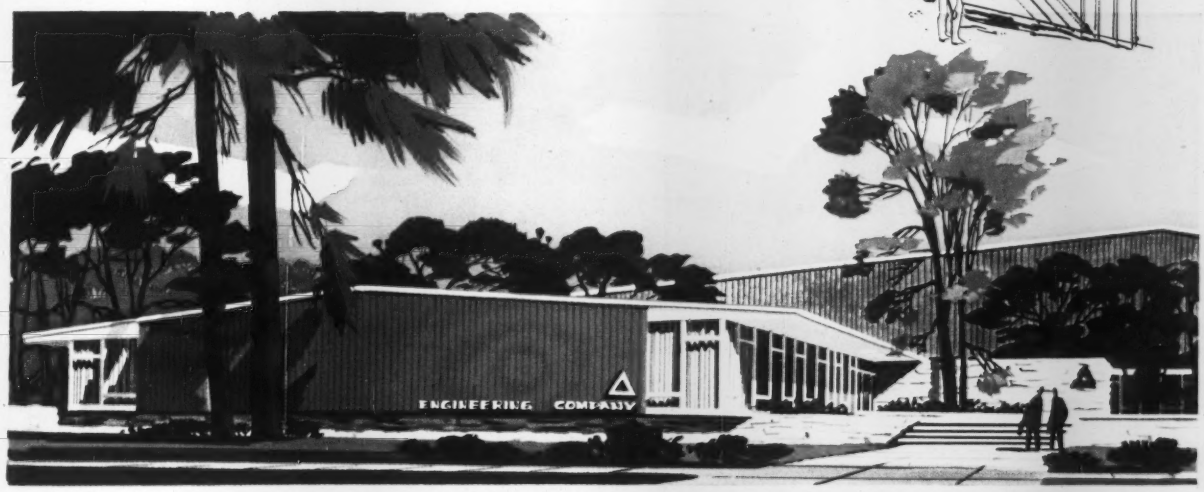
Badger Manufacturing Co., Cambridge, Mass., was the contractor. Sinclair-Koppers Chemical Co., Inc., is the owner.

Wyatt Industries of Houston, and American Bridge, Orange, Tex., built the columns.

BUILDINGS UNPRECEDENTED

by Butler, of course





Designed by James John Derks, Architect

Never before such beautiful, efficient industrial buildings for so little money

When you invest in a new industrial building, your first practical consideration is cost; the effect on your capital. Then, the building's influence on your operation. Last, but not least, reaction of people to the building. It has to please customers and clients, has to please the community in which you locate.

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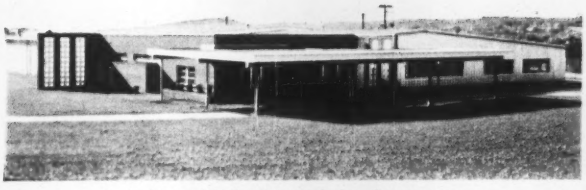


Architect / Richard J. Weibel and Associates

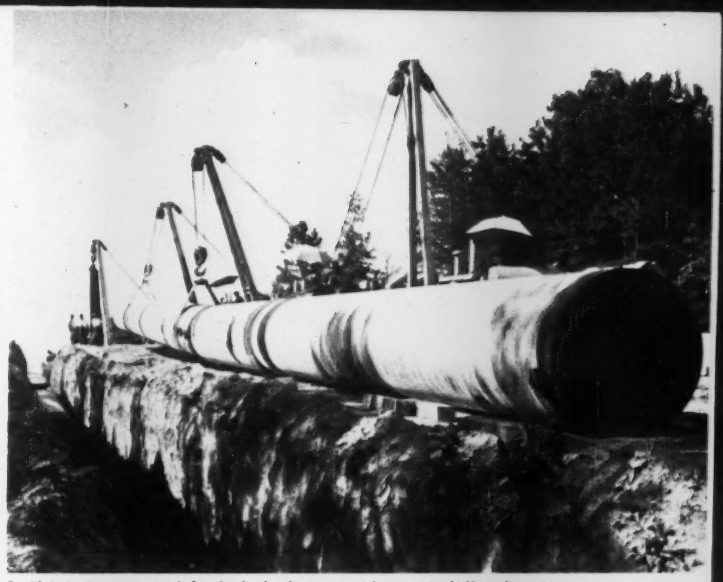
Architect / Zay Smith and Associates; Designer / Norman Steenhof

J. P. Neill strings 60-inch pipe over with never a breakdown...

Talk about tough pipe jobs! The J. P. Neill Company, Inc., as sub-contractor under Morrison-Knudsen Co., Inc., is shown laying a 60-inch water pipeline through hard rock and open pit coal mines, across two rivers, up and down mountainous slopes. So far, the Dallas, Texas, contractor has moved at a steady clip—1,000 feet a day.

When completed, the new line will provide 75 million gallons of water daily for the city of Birmingham, Alabama. It will easily meet the urgent needs of industrial and domestic users.

Before the project started, Gulf engineers helped the contractor establish an effective maintenance program based on clean-working Gulf lubricants and clean-burning Gulf fuels. These products include: Gulflube® Motor Oil H.D., Gulf Super Duty Motor Oil, Gulf Diesel Fuel, Good Gulf® Gasoline, and Gulf Multi-Purpose Gear Lubricants.



Gulf lubricants and fuels help keep equipment delivering top performance as it wrestles 20,000-pound pipe sections over tough terrain.

Olan Jones, right, Superintendent, and Ed Johns, Gulf Sales Engineer, watch closely as a pipe-layer swings into position. No delays have been attributable to fuels or lubricants.

33-mile obstacle course

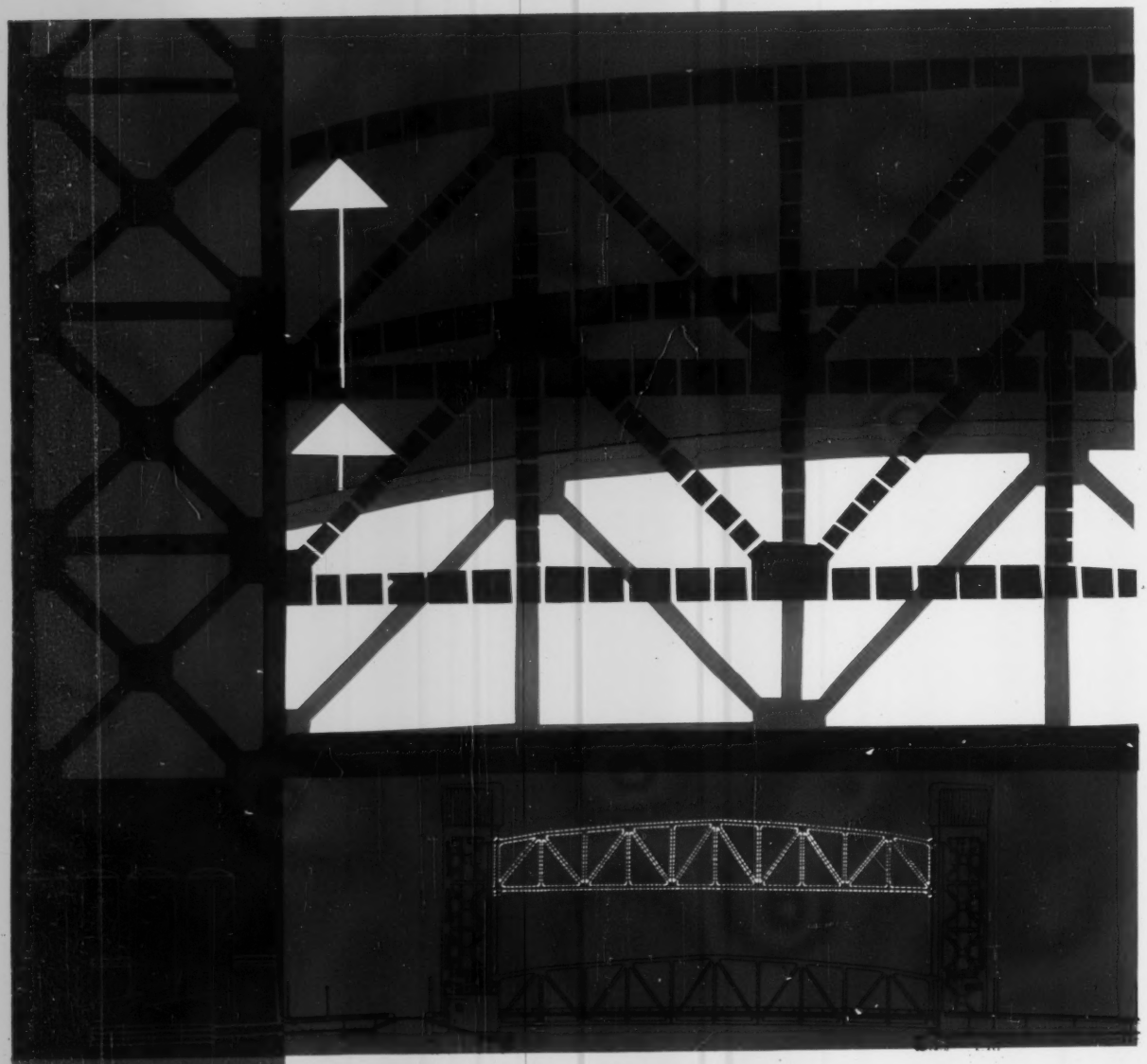
GULF MAKES THINGS RUN BETTER!

What about results? Olan Jones, Supt., answers: "Our pipe-laying tractors, trucks and welders operate 10 hours a day. They've all given top performance. Not one delay is attributable to lubricants or fuels."

Try Gulf fuels and lubricants on your next project. You'll soon see how Gulf makes things run better! Contact your nearest Gulf office for a quotation. For helpful maintenance tips, and information on Gulf products, write for 88-page "Contractors' Guide."

GULF OIL CORPORATION
Dept. DM, Gulf Building
Houston 2, Texas

GULF



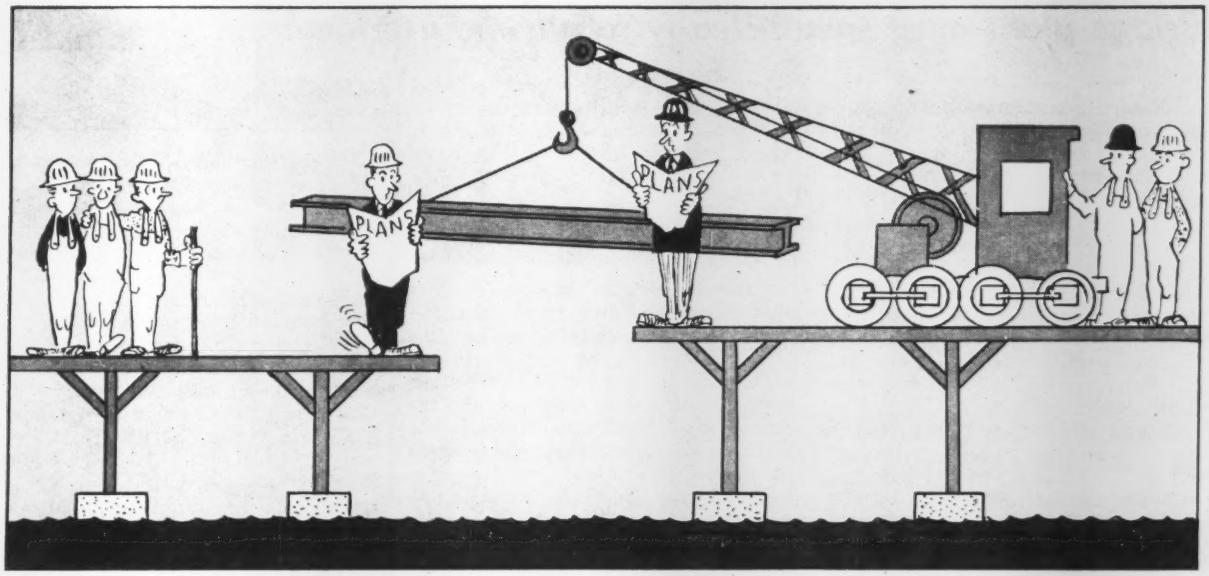
OHIO STREET LIFT BRIDGE, BUFFALO, NEW YORK

fabricated by

the

LEVINSON STEEL COMPANY

Pittsburgh 3, Pa
Phone: HUbbard 1-3200



Embarrassing situations like this need never arise if engineers . . .

Make Sure Bridge Plans Are Right

By Fred D. Hartford

Highway bridge drawings must speak convincingly not only to bridge engineers but also to highway administrators and others who may never have seen the bridge site—and possibly never will—but who are concerned with practicality, economy and appearance. The drawings must speak very plainly to bidder, to contractor, to project engineer, to inspector, sometimes even to a court.

Simple line drawings might be sufficient if structural adequacy and geometries were the only items that concerned bridge engineers. For these two considerations, the Standard Specifications for Highway Bridges and the Policies for Geometric Design of the American Association of State Highway Officials would generally be all that was necessary.

A check list for bridge drawings is necessary to avoid errors, incompleteness or other deficiencies that may make construction more expensive than necessary or lead to an unsatisfactory result.

Drawings must be complete, accurate, and capable of only one interpretation. Overly elaborate plans are to be avoided, since they often contribute unnecessarily to extra bridge costs.

Plans must be detailed enough not only for the experienced contractor who may not need explicit instructions, but for the newcomer to the field, who will. Explicit and accurate plans also aid the project engineer in his supervision of the contractor's work.

The check list described here is intended for drawings that occupy a solid block in the plans of a project that includes both roadway and bridge. The bridge plans are assumed to be complete, in that they could be removed from the project plans, given to the contractor's bridge men or to a subcontractor and would contain all necessary information to build the structure.

Highway bridge drawings can be divided into "general" and "detail" plans. The general plans picture the bridge as a whole together with its environment. The individual general drawings might be called

A. Cover or Front Sheet
B. Structure Location Plan
C. Bridge Elevation

The detail plans vary with the type of bridge, but can include the following:

D. Deck Slab Layout and Details
E. Deck Beam Layout and Details
F. Beam Bearings and Roadway Joints
G. Abutments and Piers.

Where practicable, all primary outlines of structure location, bridge elevation, foundation investigations and deck layouts should be made to the same scale so that one may be superimposed on or readily compared with any other. If drawings are made to true scale throughout it is a convenience to all concerned that the scale be noted. Odd scales like 1 in. = 15 ft or many different scales on the same sheet make study of drawings more difficult.

Each drawing should bear a definite title: for example, not merely "Details" but "Details of Roadway and Curb Expansion Joints." Labeling individual views ("Elevation Looking Upstream" or "Pier Footing Plan") helps the drawing user orient himself correctly and quickly.

To comply with the usual requirement that unchecked drawings will not be approved, the initials of the checker and the date should be shown on each sheet.

• **The cover or front sheet**—This sheet frequently will bear general notes, specification notes, design data, waterway data, estimated quantities, an index of bridge drawings for the project, contractor responsibility for maintenance of traffic, data on detours and the like. A small scale vicinity map of the bridge site showing right-of-way, utilities, buildings, conspicuous landmarks, detours, old roads and bridges will be particularly valuable to bidders and others

Mr. Hartford, highway bridge consultant of Albuquerque, N. M., has nearly 50 years experience as a structural engineer. He spent 25 years as highway bridge engineer for the U. S. Indian Service and Bureau of Public Roads.

Bridge plans must speak clearly to all who use them . . .

visiting the location for the first time.

"General Notes" may contain quotations from applicable specifications that especially concern this project or they may give the necessary additional information where specifications state "as noted on the plans."

They may include statements permitting or requiring minor deviations or addenda concerning standard specifications or standard plans. They may for emphasis give cement types, classes of concrete, grades of steel, painting, and other facts applicable to various parts of the bridge.

"Specification Notes" indicate the standard construction specifications and list special specifications and provisions pertaining to the bridge.

"Design Data" state that current AASHO Bridge Specifications are used. If there are any exceptions—and almost every state has them—then the phrase "except as shown or noted" may be used. The live loading and design stresses in the materials can follow. Monolethic deck wearing surface and any allowance for future paving should be noted. If the wind load to be used is not 100 mph then the required figure should be shown. Minimum earth pressure is quite generally shown as "not less than so many lb per cu ft of equivalent fluid pressure." Actual pile loads and unit pressure under spread footings are given where applicable. Thermal range can be quoted from applicable U. S. Weather Bureau bulletins or from local sources. (If there are long unbroken runs of metal handrail or other steel work exposed directly to the sun, then allowance may need to be made in construction for their greater expansion than that of the concrete supporting them.)

"Waterway Data" give reference to any USGS information, date and elevation of high water, area under and date built of any neighboring bridges, waterway under proposed bridge, drift, scour, drainage area, slope of streambed, Talbot factor assumed, and other facts.

"Estimated Quantities" list each item either titled in the specifications (e.g. "Excavation for Structure," "Excavation for Riprap," and so on) or explicitly defined as Class "A" Concrete for Substructure., Class "B" Concrete for Blankets, etc. Also listed should be state-supplied materials and minor fixed price items where the quantities are not predeterminable.

"Index of Bridge Drawings" includes not only "new" bridge drawings but any standard plans referred to on the bridge drawings or in the specifications. It is baffling to all concerned when the plans, for example, refer to "Type A Riprap" and there is no sheet included showing such construction.

"Detour" describes detour required; where pertinent, note that right-of-way or easement for it has been obtained.

STRUCTURE LOCATION PLAN
Sheet #2 of 7

• **Structure location plan**—Sometimes this drawing will show in one plan the approach roads, gutters, sidewalks, utilities, and so on, along with the bridge deck, curbs, gutters, handrails and other features. Or it may show only the approach roads and appurtenances on each end of the bridge and the outlines of abutments and piers, omitting the bridge deck. This latter arrangement permits showing the stream bed or the street below with bank protection, rundowns, horizontal clearances, outlines and dimensions of spread footings and other elements. The deck structure itself then appears elsewhere in the details.

Since the Structure Location Plan is generally the only drawing showing the connection of the bridge with the highway, the roadway and bridge center lines must be clearly defined by stationing, bearings and dimensions. If the bridge is on a curve or skewed, a diagram of the geometry or a "staking plan" is useful, especially if the stationing is measured on a survey line not on the roadway or bridge center lines.

If the approaches carry curbs and gutters, sidewalks and approach slabs, rundowns and so on, notes should define where roadway and bridge quantities and details divide.

References back to roadway plans on this drawing are useful for office and field alike.

If the elevation or side view drawing of the bridge as a whole is not taken as a section along the bridge profile grade, the grade elevations at abutments and piers, especially if skewed, will be more clearly shown on the Structure Location Plan.

Direction of flow in the stream channel beneath the bridge or the destinations of the road below is desirable information for quickly orienting the user.

For overpasses the horizontal location and amount of minimum overhead clearance for the road below should be shown.

Distances from lower roadway parts to any overpass walls or columns should be shown for quick checking with AASHO policy requirements.

Locations of foundation test holes should be shown by use of a distinctive symbol that will not be confused with other points.

BRIDGE ELEVATION
Sheet #3 of 7

• **Bridge elevation**—This drawing customarily will show the side elevation of the bridge or a vertical section along the centerline together with present ground line, cross-section of stream channel or highway crossed, outline of abutments and piers, bank or slope protection, foundation tests, and the like.

A location and description of the bench mark from which elevations for construction are taken are useful.

Although the direction of stationing is a guide to the direction the viewer may be looking, the additional note "Looking Downstream," "South Elevation" or similar designation will orient him more quickly and with less chance for error.

Where the roadway profile grade line and bridge grade line are not identical in plan and section then the relation between them should be delineated.

If the bridge grade is on a vertical curve a line diagram to scale should be shown. A note can indicate whether the vertical curve is that of the roadway or that of the bridge profile grade in case they are not the same. It is helpful to all users if vertical lines are added to the vertical curve diagram showing to scale the locations of centerlines of bearings on abutments and piers.

Where test piles are not driven, the designer and reviewer will be aided if rod soundings are made close to augered or drilled holes so that a comparison can be made between blows per foot of the rod and the results of the borings. They also will be helped by information as to the size of sounding rod and weight of hammer together with type and size of any auger or drill used. Elevations of ground at test sites and of bottom of hole or refusal are useful. There should be sufficient information shown to justify the substructure design.

Where the bridge layout is complicated and subsurface conditions variable, a separate plan and vertical section sheet showing foundation test data along with substructure parts shown dotted and to scale make for reliable substructure design.

If there is channel excavation, note should be made of its approximate length and under what contract item the estimated quantity is included.

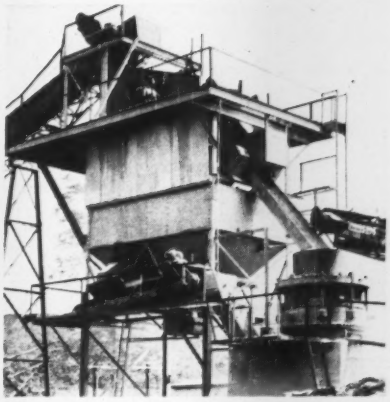
DECK SLAB LAYOUT AND DETAIL
Sheet #4 of 7

• **Deck slab layout and details**—This drawing usually shows the outside di-

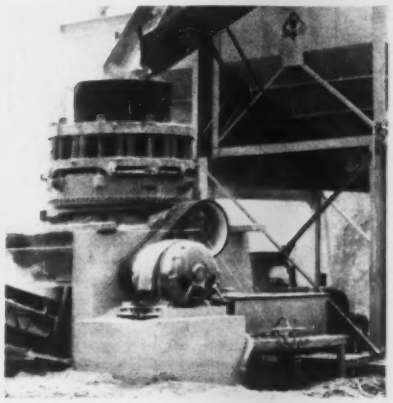
MEETS ALL SPECS IN A SINGLE PLANT

● Processing hard trap rock, this plant makes all Delaware and Maryland Highway specification sizes, as well as producing all required sizes for general construction. Plant has a cleancut straight line layout and is Telsmith equipped. As designed, the plant has unusual flexibility—a large primary surge pile; 4 stages of crushing; 3 stages of bins and screening: for modified sizes . . . for large sizes . . . and a dual tertiary stage for fine sizes. Designed for a maximum capacity of 2500 tons daily, the plant, near North East, Md., is owned by Maryland Materials, Inc., formed by Petrillo Bros., well known aggregate producers, and James Julian, Inc., prominent contractors of Wilmington, Del.

No. 1 bin with 5′ x 12′ double deck Scalper and 13-B Gyratory Crusher



No. 2 bin with 5′ x 14′ triple deck Vibro-King Screen, 48-S Gyrasphere Crusher



No. 3—two 3-compartment bins with a 48-FC Gyrasphere Crusher

TELSMITH Equipment in this plant—48″ x 16′ heavy duty Apron Feeder • 36″ x 6′ heavy duty Plate Feeder • 5′ x 12′ double deck Scalper • 13-B Gyratory Crusher • 5′ x 14′ triple deck Vibro-King Screen • 48-S Gyrasphere Crusher • two 4′ x 14′ triple deck Vibro-King Screens • 48-FC Gyrasphere Crusher • two 36″ x 72′, 36″ x 132′, 30″ x 130′, 24″ x 126′, 24″ x 74′ Telsmith Barber-Greene conveyors.

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Bridge plans need check list . . .

mensions of the deck slab and curbs, centers of bearing, handrail post spacing and reinforcing bars. The typical deck cross-section and camber diagram for setting slab screed guides also appear on this sheet.

Location of bridge profile grade should be shown on the typical cross-section.

Since dimensions between reinforcing bars are generally shown center-to-center, it is more consistent to show dimension from face of concrete to center of the outside bar than a concrete "cover" figure. Whether reinforcing bar details for the purpose of estimating quantities are made to ACI standards or with dimensions to bar center lines, one or the other system should be adopted throughout. In either case bar fabricators make up their own shop details and the pay weights are figured from them.

Note that if a longitudinal construction joint is required for a crowned deck the joint should preferably be located at the crown.

Transverse reinforcing bars should not be spliced across a longitudinal construction joint.

Quantities of concrete and reinforcing should be clearly titled for proper transfer to the quantity summary on the cover sheet.

DECK BEAM LAYOUT AND DETAILS
Sheet #5 of 7

• **Deck beam layout and details (steel)**—Shown on this sheet is the beam layout with center lines of bearings, arrangement of diaphragms, beam splices, shear connectors and beam camber diagram.

If the bridge is sufficiently complicated to require a "staking plan" or geometry sketch, dimensions of the latter should be carried back to this sheet as the starting point for dimensioning the details.

A vertical section to scale of the assembly of steel or concrete beams and concrete abutments and piers is useful to show relation of elevations and centers of bearings and especially working points where grade is involved. In case of skews a note should make clear whether these sections are parallel to bridge center line or normal to abutment or pier.

Welded field connections should be positioned for maximum down hand welding. On important welds the procedure and sequence should be shown.

If beam spacing is slightly too small to allow use of 4-ft wide plywood for slab forms, the engineer should see if spacing can be increased to allow this.

BEAM BEARINGS AND ROADWAY JOINTS
Sheet #6 of 7

• **Beam bearings and roadway joints**—This sheet shows beam bearing assemblies and details along with a diagram showing their locations on the bridge (steel). Details and locations of expansion and fixed roadway joints on small bridges can also appear here.

Pertinent to this drawing are the alternate policies of showing complicated steel parts as well dimensioned assembly pictures or as fabricating shop details. For the reviewer the former is generally preferable since it is easier to check. The fabricator will make his own shop details in any event.

Details of roadway joints should be tied back to bearing center lines, beam locations and spacings.

Field connections of expansion joint parts and beams should be adjustable and down hand welded.

For bridges skewed 20 degrees and more, arrangement should be such that sliding joint plates will lie in the plane of deck.

Number, weight and location of any superstructure castings are shown conveniently on this drawing.

Material quantities should be clearly titled to insure proper transfer to the cover sheet summary.

ABUTMENTS AND PIERS
Sheet #7 of 7

• **Abutments and piers**—This drawing often presents the abutment and pier plans, elevations and cross-sections with piling, if any, along with details of wingwalls and backwalls on abutments.

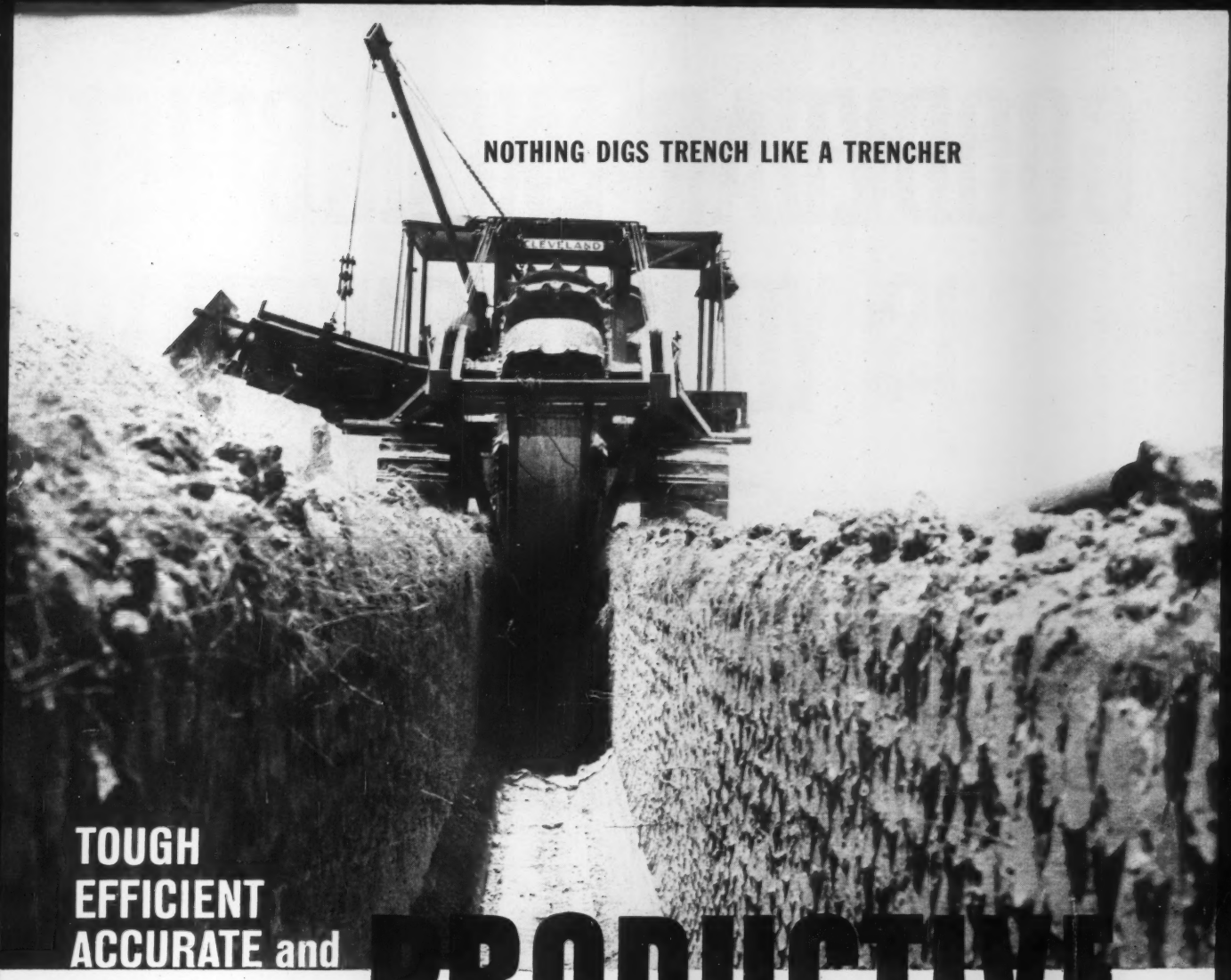
In a complicated layout working points and dimensions from the staking diagram, base line or other geometry should appear on the abutment and pier drawings as the starting points for details.

Stations and elevations for the center line of bearing and profile grade shown on the Structure Location Plan or Bridge Elevation should also appear on this drawing.

The arrangement of the roadway joint and abutment backwall should be checked to insure a permanently smooth riding joint.

Reinforcing locations should be analyzed to be certain the steel will clear anchor bolt spacing.

Since tops of driven piles may depart substantially from the plan dimensions for them, the outside lines for caps, backwalls and wingwalls should be tied to the bridge center line and center of bearings and not to the piles.



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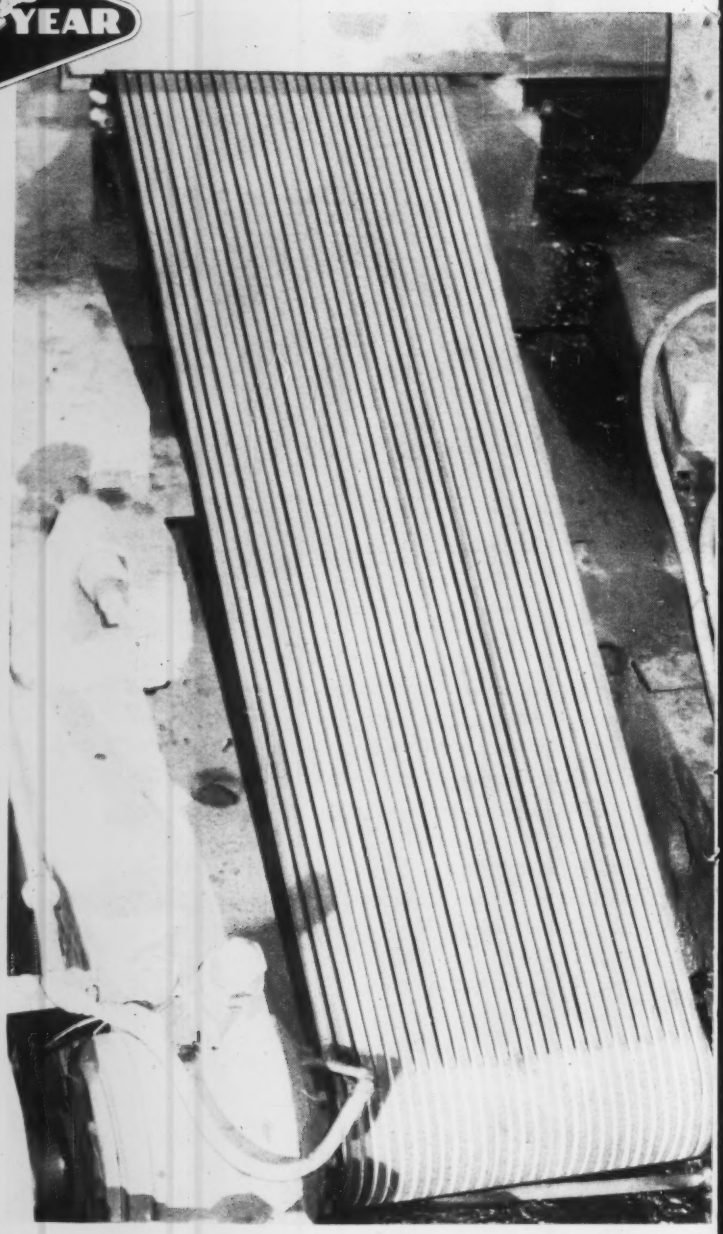

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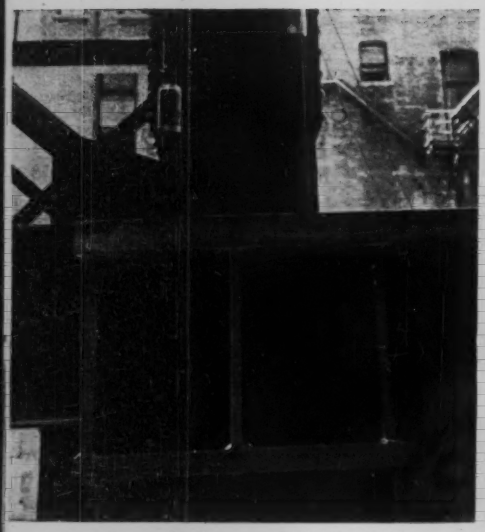
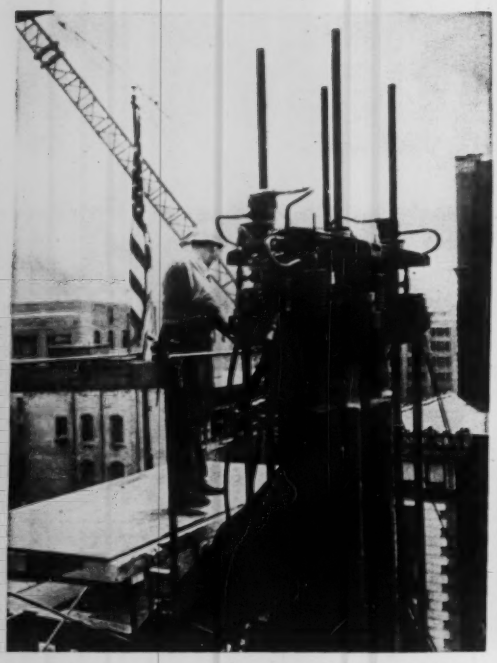
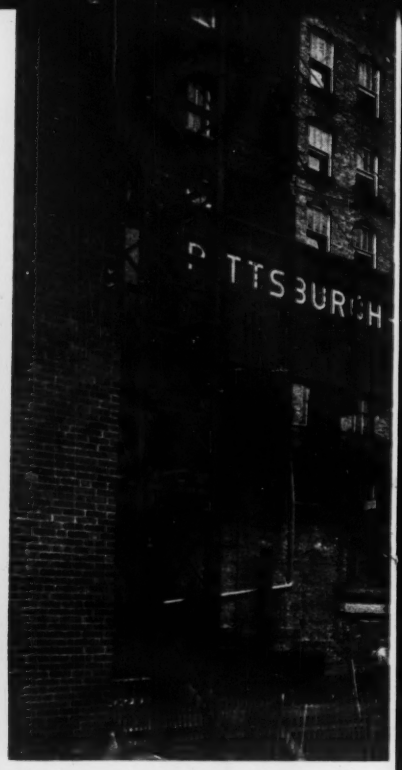


Threaded rods lifted girders.



Two jacks atop columns did the job.



Girder pair rose to the

Five Floors Hung from Long Plate

Owner's requirements and existing site conditions led to selection of an unusual design and novel erection methods for the $1.7-million Bankers Trust Building in Des Moines, Iowa. The second to fifth floors of the 125x67-ft structure are suspended from a pair of side-by-side steel plate girders spanning 84 ft between steel towers. Hydraulic jacks atop the columns of the towers raised the girders as a unit.

The girders, 15 ft deep and weighing about 50 tons apiece, were lifted 71 ft.

• **Design restrictions**—The new building replaces an existing two-story structure housing the bank. It adjoins an existing 70-year-old, 12-story building, also owned by the bank, which will be replaced. While construction operations are underway, the bank has temporarily moved into the adjoining building.

For the new building, bank officials wanted:

• An unobstructed banking area on the first floor.

• No interference with the bank's vault, in a basement under the two-story and 12-story buildings.

• Provision to be made for tearing down the 12-story building eventually.

The scheme adopted by the designers, though perhaps more expensive than other possible alternatives, offered these advantages:

• Areas 67 x 86 ft unobstructed by columns are provided on the first floor and 55 x 85 ft on the four upper floors.

• New construction is completely clear of the bank vault.

• No structural connections are made between the new building and existing one.

• Foundations of the new building are far enough from the old building's to eliminate underpinning, or to require work that might interfere with the transplanted banking operations.

• **Key members**—Floors of the five-story building are supported at one side by a row of steel columns along an alley and at the opposite side by hangers from the roof-level plate girders. Floor and roof beams cantilever 10 ft beyond the girders and hangers to the wall of the existing 12-story structure.

The pair of girders are supported at their ends by one column of the four in each of the twin steel towers. Except for the topmost portion, both of these key columns are oriented with webs parallel to the girder webs. But the upper 7.5 ft—about half the girder depth—is rotated 90 deg, to permit framing the girder webs to the column flanges, to simplify the connections and reduce bending stresses in the columns. The rotated column sections are seated on pin-ended rocker plates set on a heavy cap plate.

The girder-supporting steelwork also doubles as elevator towers. One will be used for service elevators, the other for passenger service. In addition, provision had to be made between the towers for future elevators.

Each tower is carried on 32 H-piles, driven 50 ft to shale. Heavy steel grillages are interposed between towers and piles to distribute the loads and form the walls of the elevator pit. Composed of 25 tons of box girder and base plates, each grillage was shop assembled and erected in one piece.

• **Alternative designs**—Before the designers decided on the plate girders as a support for the hangers, they considered a truss. They found it would have to be constructed of heavy 14 WF sections, and because of high secondary stresses, two 1½-in.-thick cover plates would have to be added to the top and bottom chords.

When the fabricator reviewed this design and contemplated development of the sections, he found that it would be impossible to stress relieve properly the various connections involved. In addition, two field splices would have been required. With stress relieving, that was well nigh impossible. So the fabricator recommended two plate girders with the hangers between them.

• **Girder details**—The girders were designed for a load of 460 kips to be trans-

top of the new building.

Girders

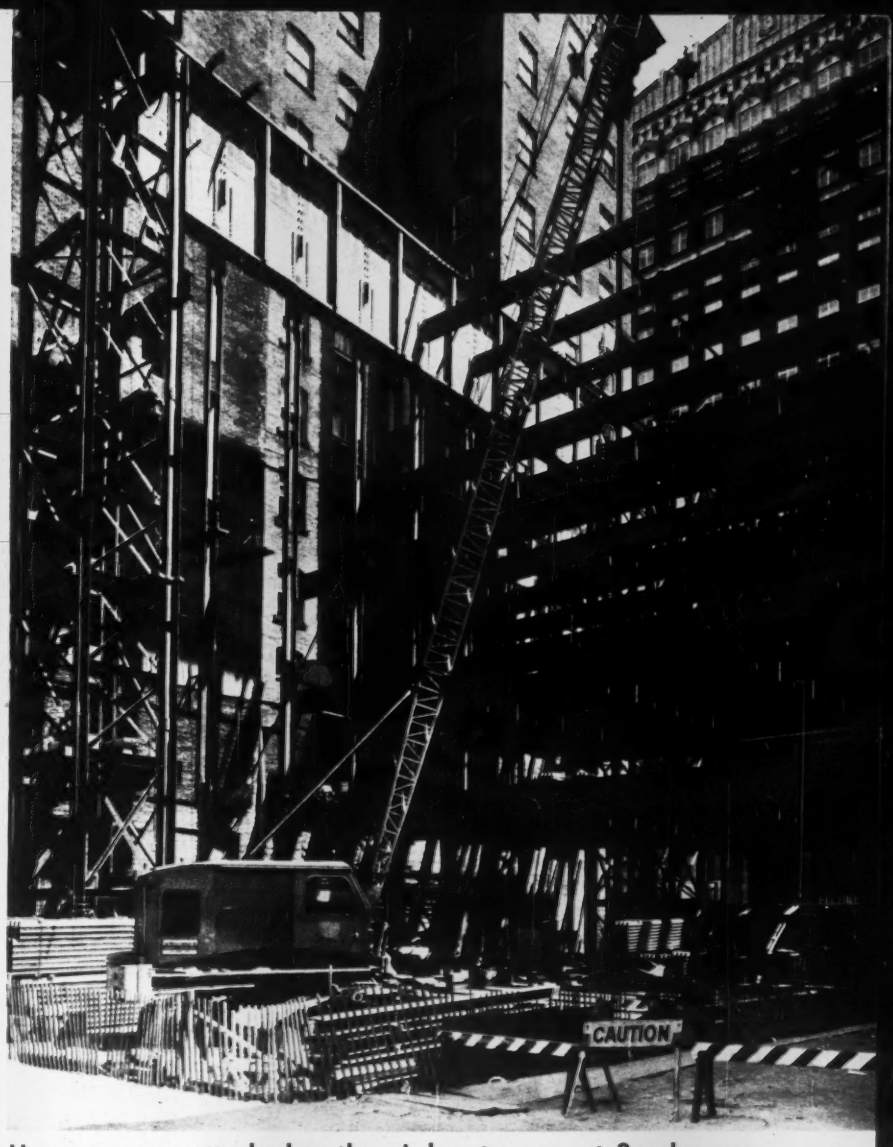
mitted from each of seven hangers. They also carry a 50-kip roof load directly.

The requirement that provision be made for future elevators restricted the width out-to-out of the two bottom flanges of the girders to a maximum of 30 in. Each flange is a plate 10 in. wide, and the space between for hangers is 9½ in. wide. The total out-to-out is 29½ in., meeting the requirement.

The bottom flanges are 5 in. thick at midspan and 3½ in. thick for a distance of about 20 ft at both ends of the girders. The top flanges are plates 18½ in. wide, 4½ in. thick at midspan, 3½ in. at the ends. The webs are 15 ft deep, 1⅛ in. thick at midspan and ⅞ in. for a distance of 12 ft at both ends. This arrangement of material raised the center of gravity of the section 12 in. above mid-depth.

The webs are spaced 19½ in. c-c, permitting 18 WF 50 sections to be inserted between them as separators and stiffeners. Tees cut from 16 WF sections serve as vertical stiffeners on the exterior. In addition, a 5 x ⅜-in. plate is used as a horizontal web stiffener.

Each of the seven hangers attached to the webs of the girders consist of two plates and a 14 WF 30. The plates, 8½ in. wide, range in thickness up to 2⅛ in. at the bottom of the girders. The hangers extend down 55 ft to the second floor. Openings in them permit the floorbeams to pass through and cantilever to the wall of the existing building. The hangers have stiffened seat connections at each floor to support these beams.



Hangers were attached to the girders to support floorbeams.

• **Erection in tight space**—The 84-ft girders were transported separately from shop to site. Because of their depth—nearly 16 ft—they have to be moved with web horizontal. In transport, each was set on two low-boy tractor-trailers, the rear unit being driven backwards.

There was little room for manipulation at the sites; the street is only 56 ft wide and distance between buildings on opposite sides only 80 ft. To jockey the long girders into place, the erector had to convert the entire ground floor into a working platform.

This was accomplished by finishing the basement and putting in all first-floor framing. This level then was floored solidly with 2x6's laid on edge and bolted together in mats. Extra capacity to carry the weight of girders, delivery trucks and cranes was achieved by shoring the floor. Maximum load imposed by the cranes' outriggers was about 57 kips.

When the two girders were positioned on the floor, they were connected together. Next, the towers were erected, a feat that could not be executed previously because the girders straddle the columns that support them. Temporary bracing was added to the towers during erection of the girders.

• **Jacking the girders**—A system of channels, anchor bolts and stiffeners was installed at the top of the columns supporting the girders to hold the columns rigid during the operation of the hydraulic jacks atop them. The jacks were hung on short channels cantilevered out. Threaded lifting rods 2 in. in diameter extended from the jacks to connector brackets welded at the ends of each girder.

(Please turn the page)

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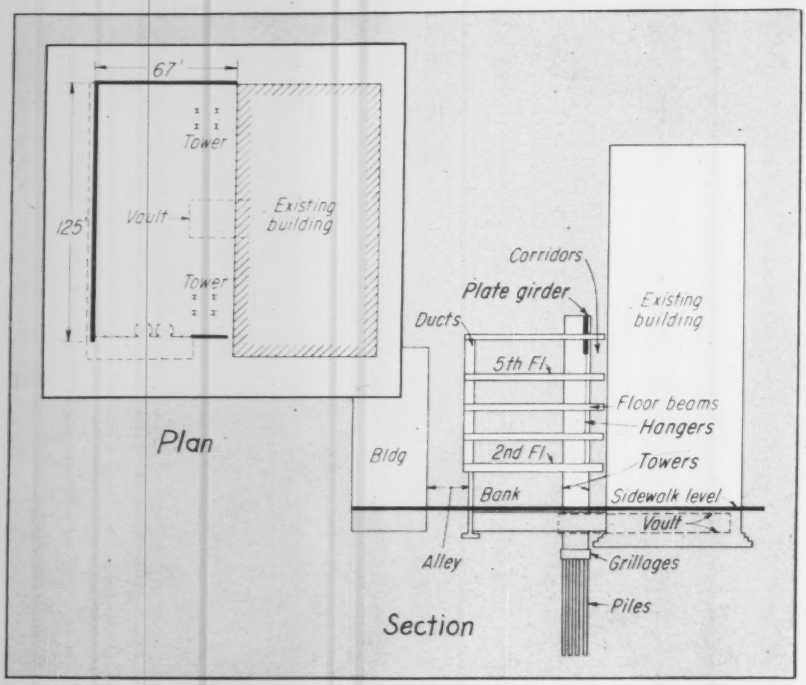

SUSPENDING FLOORS from a pair of roof-level girders kept new construction clear of an existing vault and building.

Two jacks, each of 50-ton capacity, were set on each column, and each jack operated two lifting rods. A single operator at a console controlled all four jacks.

Lifting rods came in 20-ft lengths. Splices were staggered so that one pair of rods at each column would be continuous at all times between jack and girder, since the connector sleeves were too large to pass through the threaded openings in the jacks and had to be removed as they reached them.

The 100-ton girders were lifted 3 ft per hour. Built-in safeguards kept the operation routine. If the girders got more than 1 in. out of line, an automatic device cut out the jacks at the high end until the other set of jacks brought the girders back to level. The operator at the console on one tower, crews on the ground and men atop the other tower were connected by telephone. And a level on the ground kept a constant check on the hoisting. When the girders reached their final position, they were connected to the columns with 200 high-strength bolts at each end. After that, the temporary stiffeners were removed from the towers.

Cost of jacking the girders was about $1,200. Conventional erection with A-frames and block and tackle is estimated at $5,000.

• **Continuation also unusual**—The presence of the towers and girders determined the method of setting the balance of the steel framing. A single, 10-ft-wide bay extending the width and height of the building was erected at a time.

Erection started at the end of the building farthest from the street. A pair of columns were erected about 10 ft apart, in line with the hangers. Sizes of the columns were determined by the necessity of balancing the compressive strains in them with the tensile strains in the hangers, to maintain the floors level. (Had this been ignored, floors might have gone out of level by as much as 1½ in.) After the columns were braced, the floorbeams were slipped through the openings in the hangers, set on their seat there and then connected to the columns.

Successive bays were erected in this fashion until all the framing was in place. Finally, a 4½-in. cellular steel deck was installed on the beams.

The street side of the building is enclosed with glass, the alley side with sculptured precast concrete panels. The space behind the alley wall—a 2-ft-wide strip overhanging the ground floor—is occupied by air-conditioning ducts, wiring and piping.

Brooks-Borg was the architect-engineer, with John Rice as architect and Charles Vanderlinden and John Hart as structural engineers. Weitz Co., Inc., and Ringland-Johnson, Inc., were the general contractors, under a joint venture. William Shull was superintendent. Pittsburgh-Des Moines Steel Co. fabricated the girders. All are Des Moines, Iowa, firms. Skyhook Lift Slab Corp. of Overland Park, Kan., hoisted the girders.

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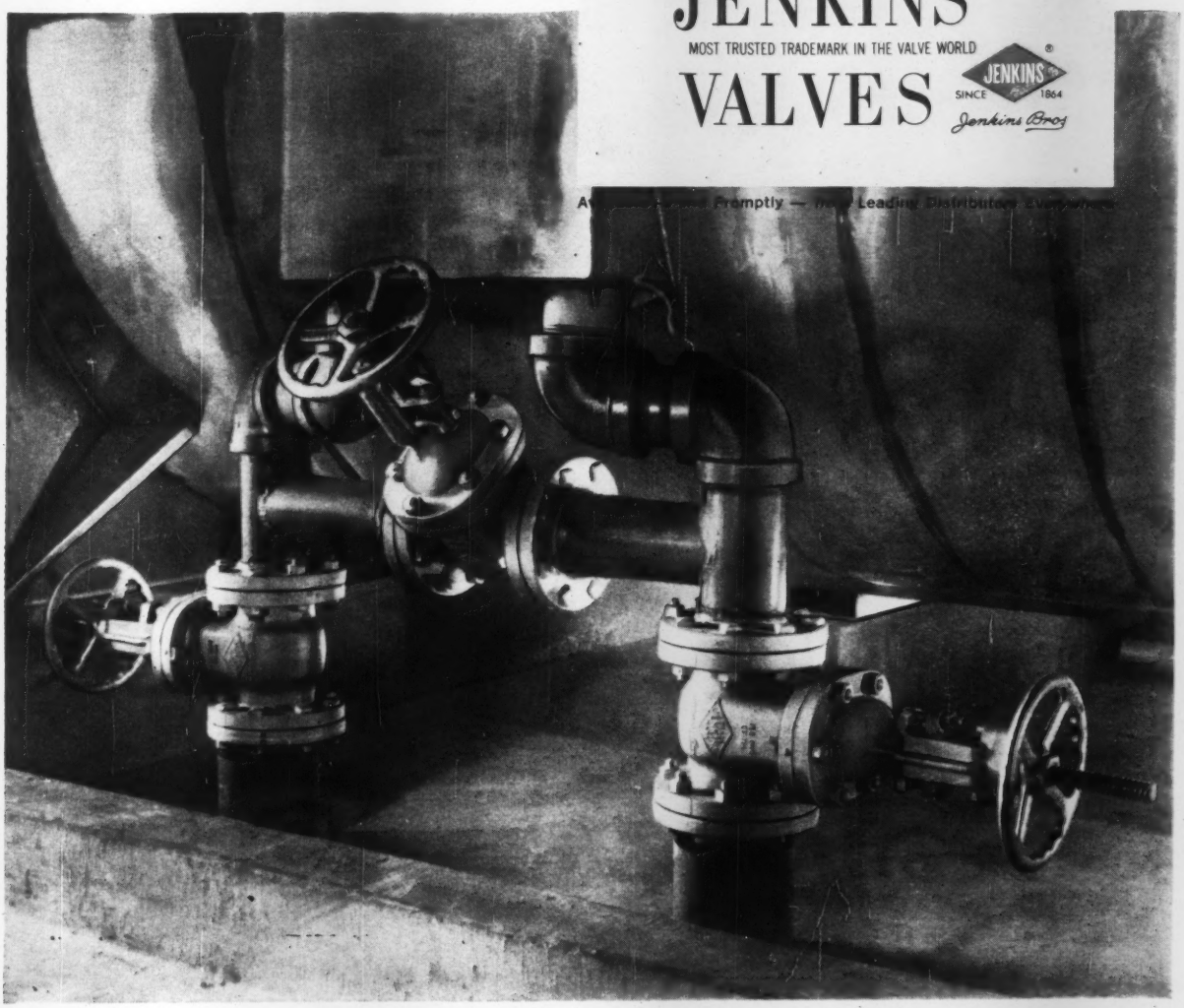

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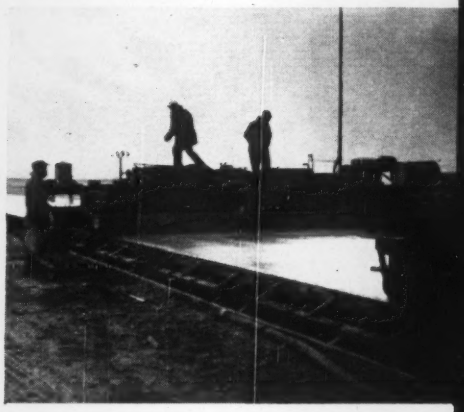
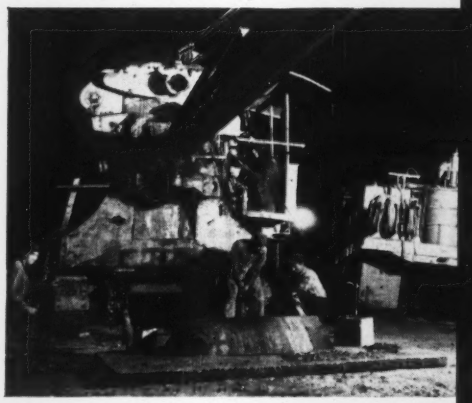
Quarry and crushing facilities operated 6 days a week, on two 10 hour shifts, with machinery lubricated between shifts. Daily 7 to 10 thousand tons of rock were processed to produce stone for concrete and "roadstone" for runway base. Western even set up a rod mill to produce high quality sharp sand from fines. (Below, right) To help keep operations going steadily, Western employed 2 tank wagons for on-the-spot fueling at the quarry. (Below, left) An in-line, dry-batch plant was set up on the job by Western. Batch trucks fitted with 4 bin separators, each bin holding 1.37 cu. yd. batch, were used. 4 exactly measured charges were delivered to each bin.

Knowing how one contractor meets the demands of time, efficiency, profit, may help you in your next job.

Trucks, water tankers, etc., were serviced from 1 week to every other day. Basic lubricants were Delvac, Mobilplex EP and Mobilgrease MP.



From dawn to dusk, on 10 hour shifts, 5 to 6 thousand yds. of concrete were placed each day. Final finishing operations went on into the night.



Maintenance and lubrication was also done mostly at night. Critical earth-moving and paving equipment was lubricated and oil changed daily, with fuel and lubrication trucks brought right to the machinery site.

How Western meets $11,000,000 contract for 1st all-jet civilian airport

Contractor moves 90 carloads of equipment 2,000 miles—sets up complete operation from quarry to batch plant

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Starting from scratch, Western set up a completely integrated, self-sufficient operation. It shipped in almost 90 railroad carloads of equipment for quarrying, rock-crushing, batching, earth-moving, and paving in addition to over-the-road equipment. *From raw rock to in-place concrete, all elements were controlled by Western.* Western established its own quarry and crushing facilities to insure quality and supply. It set up a batch plant and drilled its own well. Western relied on two outside suppliers. One was for vital cement needs. The other, for lubricant and fuel needs, was Mobil. Mobil scheduled deliveries round the clock. Mobil also worked out efficient storage and handling facilities, supplying and installing, eleven 4,000 gallon storage tanks plus high speed pumps.

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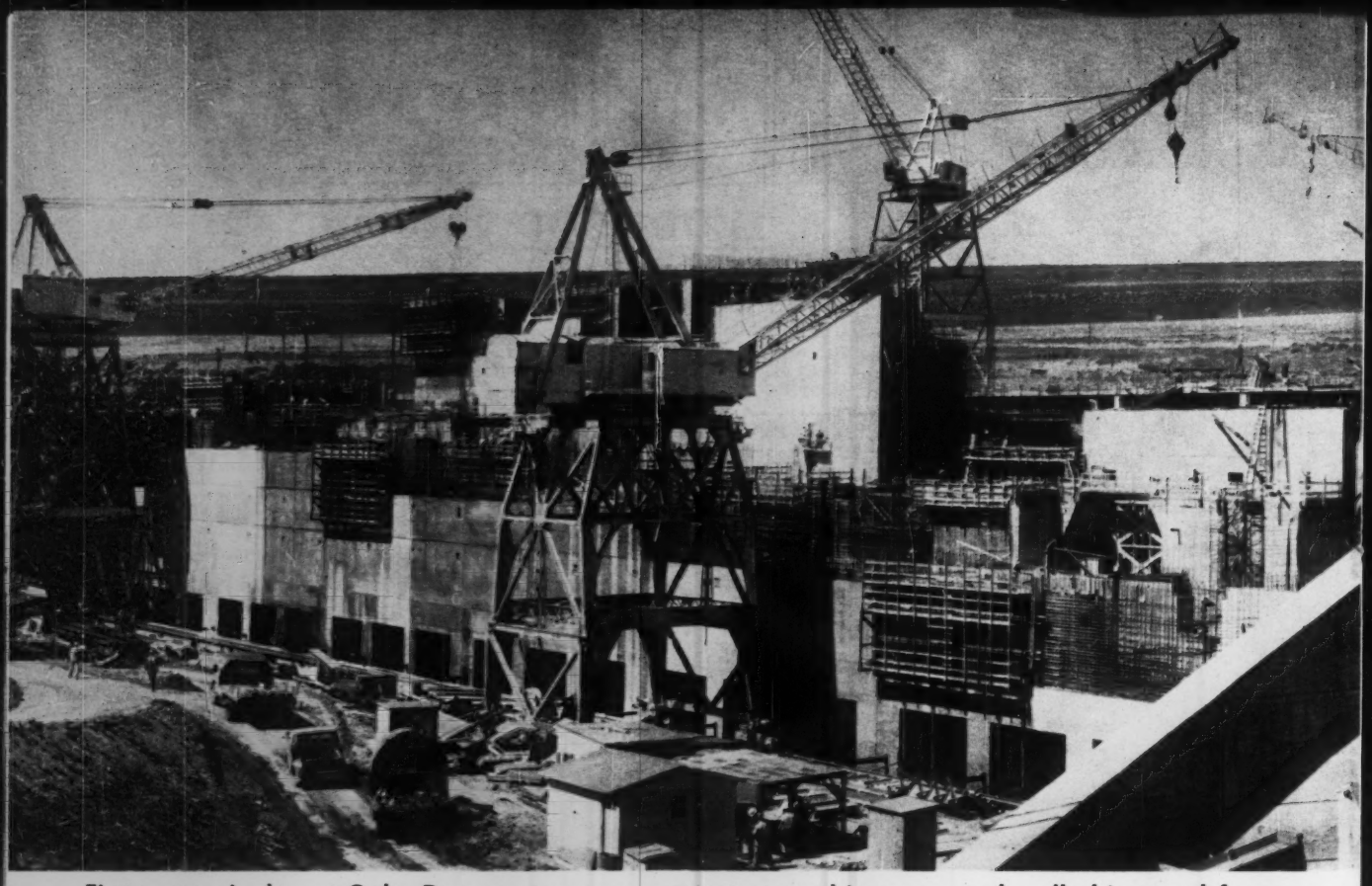


First power is due at Oahe Dam next year so concreters use big cranes to handle big panel forms.

Oahe Concreters Go Around-the-

Large-scale concreting continued through the winter at Oahe Dam near Pierre, S. D. An insulated batch plant with hot air heat plus a hot air heating system under the aggregate stockpiles helped to keep two contractors going on nearly $25 million worth of reinforced concrete structures.

Atkinson-Ostrander Co. hold a $19.4-million contract for constructing surge-tank bases and the powerhouse superstructure, which will house seven 785,000-kw generators.

Western-Knapp Engineering Co. holds a $5-million contract for constructing the intake superstructures for the seven 24-ft power tunnels, also under construction under another contract.

Between them the two firms kept nearly 1,200 men busy around the clock throughout the winter.

Tight scheduling, as well as the size and complexity of the work at Oahe, called for pushbutton concrete production, over-size panel forms, and big equipment to handle forms, concrete, and reinforcement.

• **Powerhouse and surge tanks**—The surge-tank bases and powerhouse superstructure contain 222,000 cu yd of concrete, reinforced with 11,750 tons of re-bars. Over 100,000 cu yd of concrete had been placed by the end of 1960. Maximum concrete placements reached 1,390 cu yd per day and 6,050 cu yd per week.

One yardstick of concreting operations is the amount of formwork involved. Engineers estimate that 1.9 million sq ft of area will be formed in constructing the powerhouse and surge-tank bases.

Little wonder, then, that panels are big. Largest single form used so far was 48 ft long and 16 ft high. It weighed 17 tons. On an average, panel forms for the surge-tank bases measure 40x20 ft and weigh from 10 to 12 tons. Those in the powerhouse are about half that size and weight.

Both plywood and tongue-and-groove lumber are used in making forms. Plywood forms are reused an average of 10 times, tongue-and-groove forms, about 18 times.

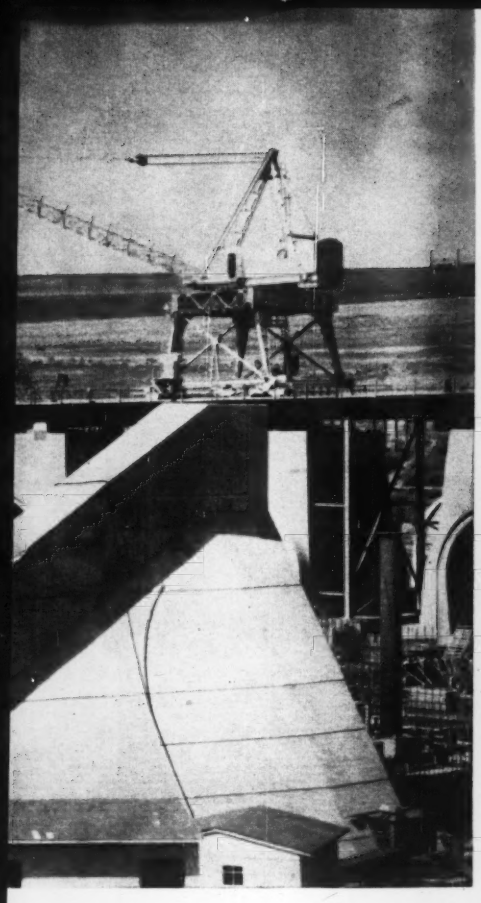
• **Automatic batching**—Keystone of concrete operations on Atkinson-Ostrander's contract is the batching and mixing plant, which came from Pelton Dam in Oregon. It contains four 2-cu-yd synchronized mixers fed by a revolving chute from a common batching hopper. They discharge into a collecting hopper for loading the concrete into 4-cu-yd buckets transported by trucks to the powerhouse. Its five-compartment bin holds 350 tons of sand and coarse aggregate.

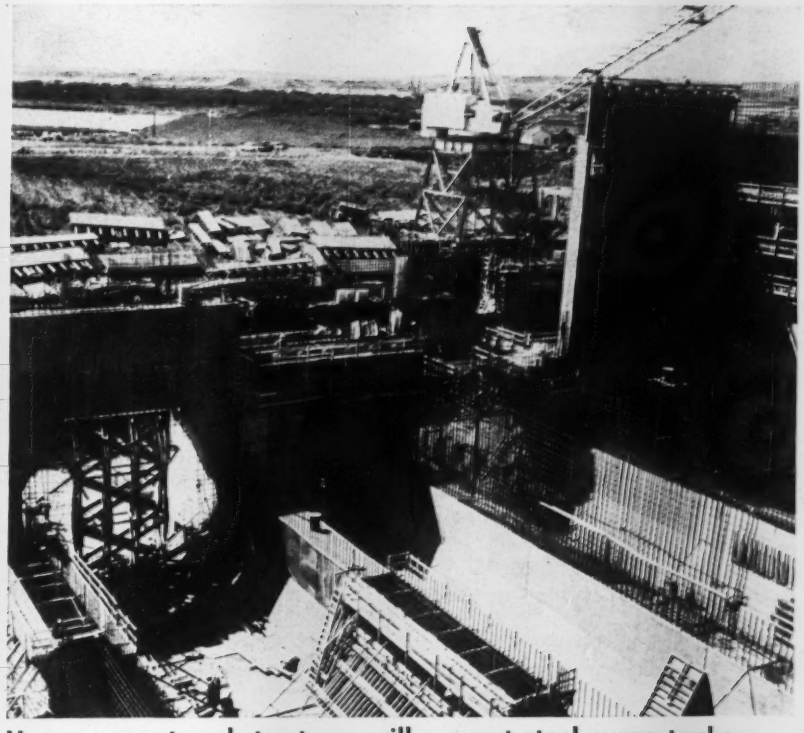
The plant, operated by a foreman and four men, produces about 125 cu yd of concrete per hour when everything is running smoothly.

In addition to the batch-plant operator, one man is in charge of aggregate screening at the stockpile above the reclaiming tunnel, one man operates in the reclaiming tunnel, and the fourth man controls the loading of the 4-cu-yd buckets.

Several mixes of concrete are used in the various structures. A typical mix for the most common 2-cu yd mix of concrete is 800 lb of Type II cement; 1,820 lb of sand; 1,620 lb of aggregate ranging from No. 4 size to ¾ in.; 1,420 lb of ¾ to 1½ in.; 2,025 lb of 1½ to 3 in.; and 410 lb of water. An air entraining agent is also added to produce 5½ to 6% entrained air.

The control board of the semi-automatic concrete batching and mixing





Heavy concrete substructures will support steel surge tanks.

Clock

plant generally is preset for six different mixes. The operator simply selects the mix to be run and materials are then weighed out automatically.

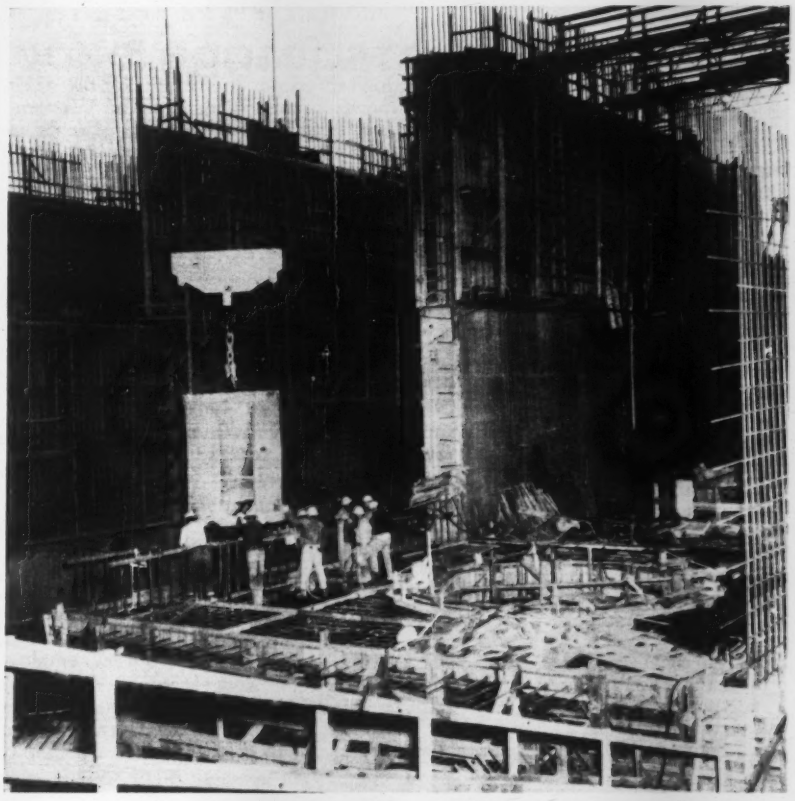
When all the aggregate, cement and water have been weighed, they are discharged into a 15-ft-dia collecting hopper equipped with a 6-in. external vibrator. A swivel chute directs the batch into one of the four mixers.

Bulk cement is delivered to the plant by rail. A 500-bbl bin in the batch plants is supplied by bucket conveyor, while a second bin provides 5,000 bbl storage.

Sand and coarse aggregate arrive in railroad hopper cars. These are unloaded through a plate feeder to an 800-ft-long conveyor belt. This conveyor feeds a 100-ft-long traveling belt conveyor that deposits the material above the reclaiming tunnel, an 8-ft-dia corrugated metal structure, 425 ft long.

Concrete is trucked from the plant to the powerhouse. Each truck carries two 4-cu-yd buckets.

Atkinson-Ostrander works an average crew of about 800 in three shifts during peak concrete production. They place forms and steel during the two daytime shifts, concrete at night. The panel



Concrete is placed near risers from tunnels to surge tanks.

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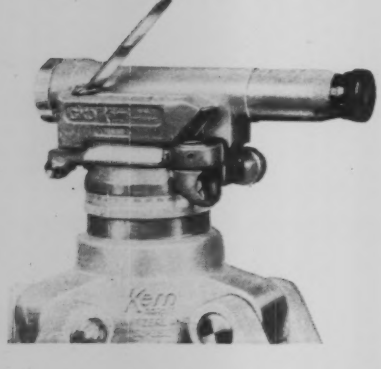


POWER INTAKE stands on substructure that extends 150 ft below grade to connect with tunnels. Intake shaft ties to pot-like valve chamber.

forms, reinforcement, and concrete buckets are handled by four gantry cranes, two operating on each side of the powerhouse superstructure and surge tank bases. Three of the gantries are 80 ft high, while the other is 24 ft high. All four mount 140-ft booms and operate on rails spaced 32 ft c-c. They handle the big forms with a steel beam strong-back and a four-point pick-up.

• **Tunnel intakes**—Each of the 145-ft-high intake superstructures for the seven power tunnels being built by Western-Knapp requires 6,000 cu yd of concrete and 300 tons of reinforcing steel. They are located directly above the power tunnels, which are spaced 90 ft c-c.

The superstructures are being constructed on top of circular substructures —built under a separate contract—which extend down nearly 150 ft to a 90-deg elbow at the upstream end of the power tunnels. They are being built in 11-ft lifts using reinforced concrete.

Concrete is batched and mixed in a concrete plant formerly used at Fort Peck Dam. It contains two 4-cu-yd mixers. Trucks carrying two 2-cu-yd buckets haul the concrete from the plant about ½ mile to the intake structures, where truck cranes place it directly in the forms. Eventually these cranes will mount 200-ft booms and 30-ft jibs to place the last concrete at the top of the superstructure.

Western-Knapp works two 10-hr shifts per day, six days a week, employing a total work force of about 350 men. Steel forms for the concrete are moved from one intake structure to the next one by a truck crane with 50-ft boom. All concrete in these structures is water cured.

Each of the seven intake structures will house a 60-ton, 30-ft-dia cylindrical gate operating in a 280-ton steel frame. Three stems on each gate extend up to a worm drive electric hoist, driven by a single 25-hp motor.

• **Oahe's been going 10 years**—Oahe Dam has passed a number of milestones and has had its share of crises during its 10 years of construction.

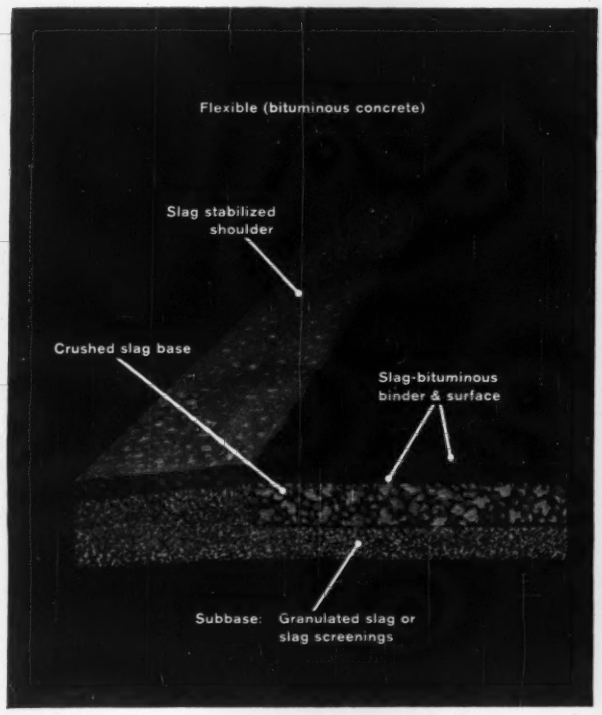
The first of its 91 million cu yd of embankment was placed in mid-1950. By the following spring, dirt really began to fly (ENR Mar. 15, 1951, p. 32). Second-stage embankment was started early in 1952 (ENR Jan. 24, 1952, p. 120), and tunneling got under way two years later (ENR, Dec. 2, 1954, p. 24).

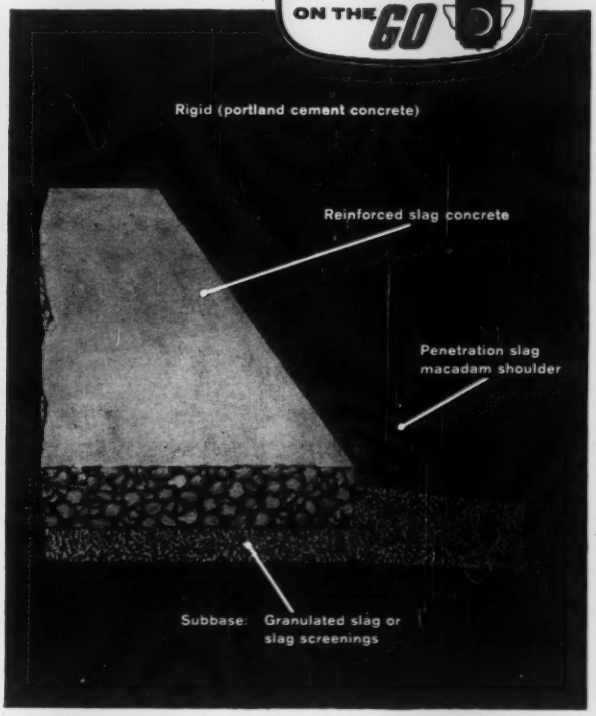
In 1956 construction was slowed by a 2-million-cu-yd earth slide at the left abutment (ENR Oct 11, 1956, p. 40). And two years later, closure of the rolled fill embankment was successfully accomplished in less than 24-hours (ENR Aug. 14, 1958, p. 21).

Contract completion date for all seven power-intake superstructures is Dec. 1, 1962. First hydro-power generation is scheduled for July, 1962, and ultimate completion of the $380-million, multiple-purpose project is scheduled for mid-1965.

John W. Sibert, Jr. is area engineer in charge of the Oahe Dam project, reporting to Col. Harry G. Woodbury, Jr., Omaha District Engineer, Corps of Engineers. Richard C. Warder is resident engineer on the powerhouse. John Gillam is resident engineer on the upstream power intake. William Buehler is general superintendent for Atkinson-Ostrander. Len Fusen is project manager and R. B. Williamson general superintendent for Western-Knapp.

Cross-Sections of Typical Pavements

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Penetration slag macadam shoulder
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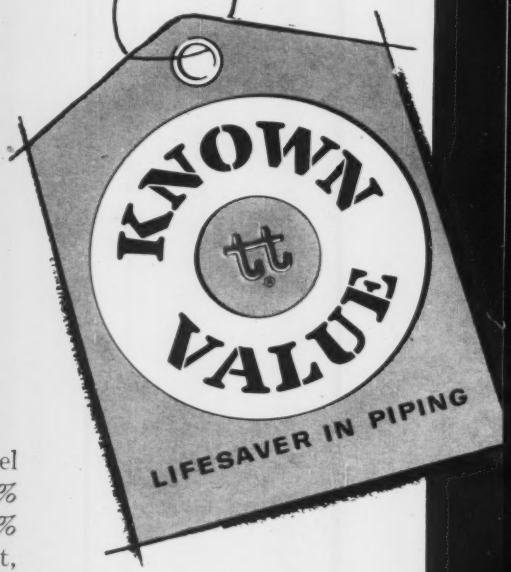

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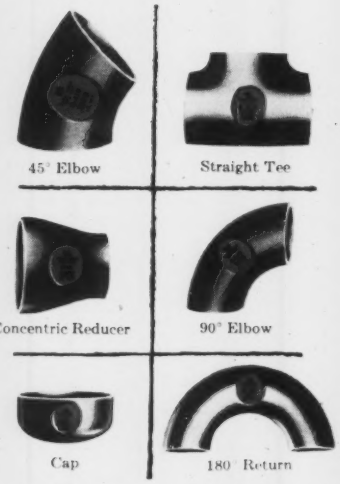

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A 'Hybrid

A fourth generation mining machine, called the Prairie Miner, recently holed through the last of seven power tunnels at the Corps of Engineers' big Oahe Dam on the Missouri River. Displaying traits inherited from its forbears, the latest model mined the downstream 2,200 ft of the 29.6-ft tunnels for Prairie Constructors.

The machine, which cost $550,000 is said to provide closer roof support at the heading than its predecessors.

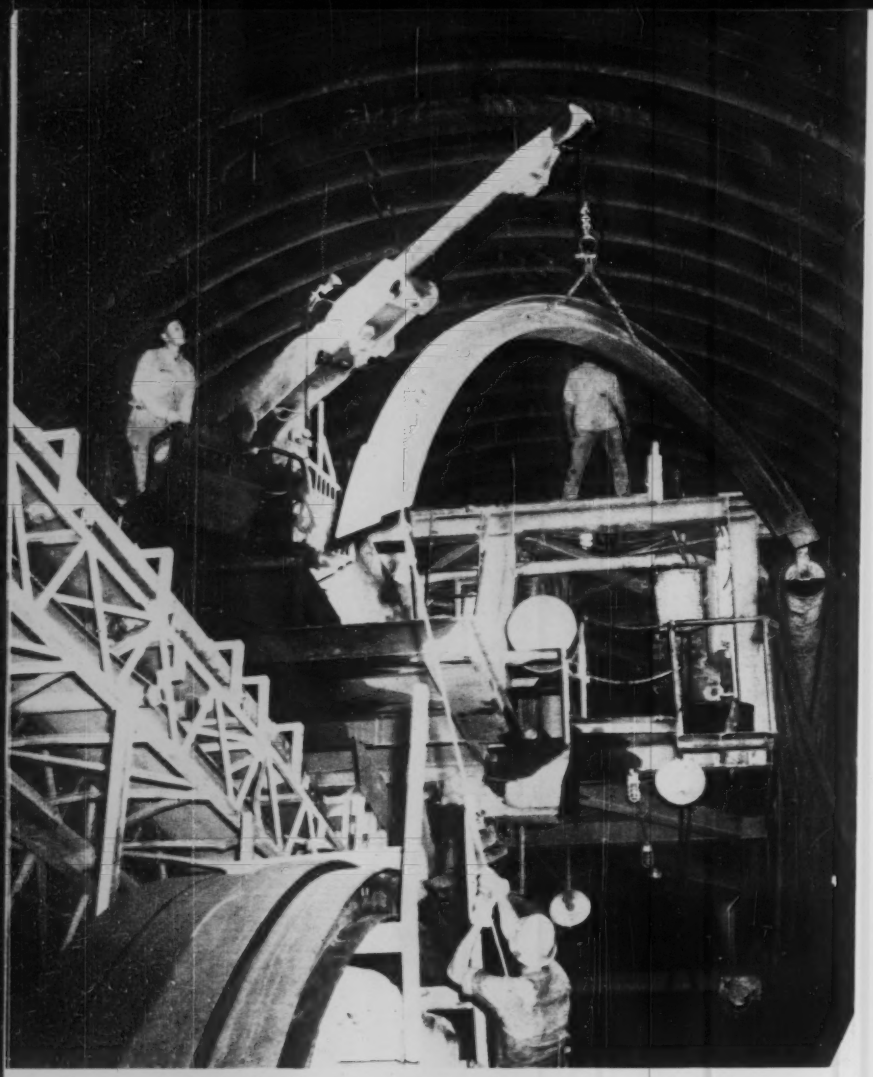
The tunnels at Oahe Dam were driven through Pierre Shale—the same shale that gave engineers trouble on the powerhouse substructures at Oahe. It deteriorates almost immediately on exposure to air.

(See the article beginning p. 50 for more about the powerhouse and ENR July 23, 1959, p. 42 for more about the troublesome shale.)

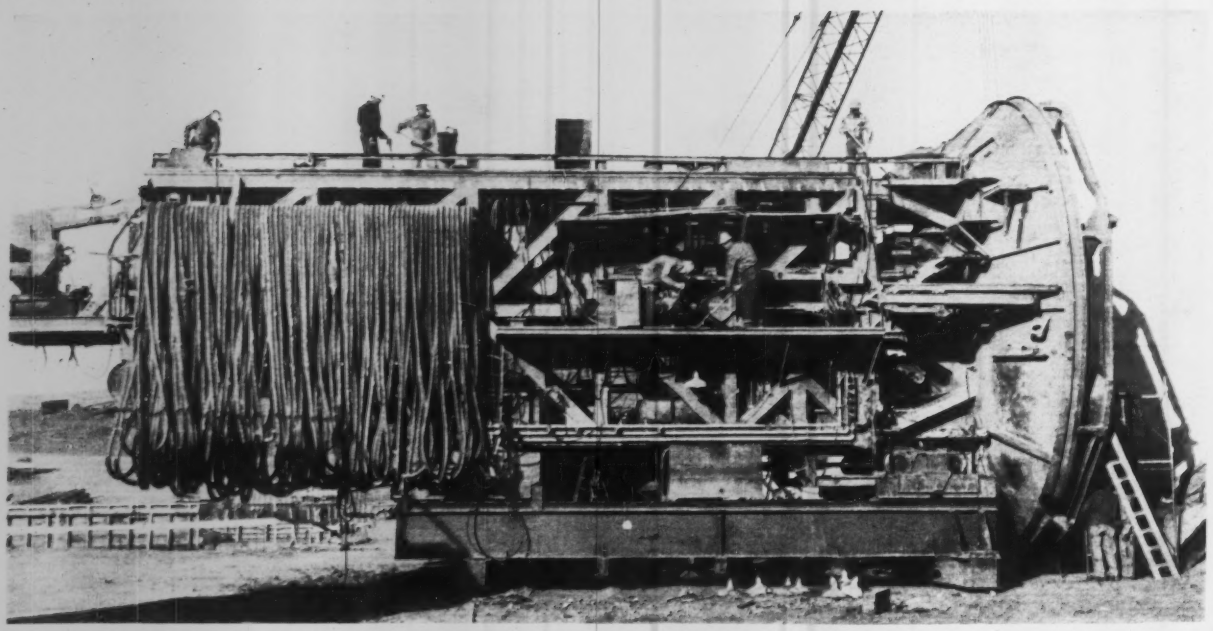
To avoid rockfalls, the contractor installed ringbeams as close to the working face as possible. Shale surfaces were protected from deterioration by 3 in. of mortar sprayed on wire mesh within 24 hours after exposure of the shale to the air.

Like its predecessors, the Prairie Miner carries plenty of weight and power for continuous rugged operation. It is 64 ft long and weighs about 175 tons. It is steered and propelled by hydraulic rams with a total available thrust of 150 tons.

The big rig also packs a total of 750 hp for driving its two cutterheads. Total



Crane on rear of miner passes ring beams to erection jig.



Prairie Miner weighs 175 tons, advanced 156 ft in one day through shale.

Mole' Wraps Up Oahe Tunnels

available torque at stall load is 20 million in.-lb.

The Prairie Miner's cutting head embodies some of the best features of the three previous mining machines at Oahe. The cutting head consists of two concentric, counter-rotating discs with cutting teeth mounted on the front surface.

The 20-ft-dia inner cutter head has two radial rows of teeth. It is powered by two 150-hp electric motors, each driving through a three-stage torque converter and double reduction gear.

The outer cutterhead has three radial rows of teeth. It has a 29.5-ft outer diameter and a 20-ft inside diameter. Its three drive units operate in the same manner as those for the inner cutterhead.

Each cutterhead can be operated independently and in either direction. Silicate concretions embedded in the shale in some stretches were rough on teeth and resharpening was necessary in as short a distance as 5 ft. In other stretches, up to 1,000 ft of tunnel was mined before it was necessary to sharpen teeth.

Best day's mining was 156 ft in three 8-hr shifts. Average advance per day on the final tunnel was 93 ft.

A 24-man crew, including two mechanics and an electrician, manned the mining machine each shift. An additional seven men supplied materials, such as structural steel ring beams, mine ties, wire mesh and timber blocking, that were used to support the tunnel roof and sides.

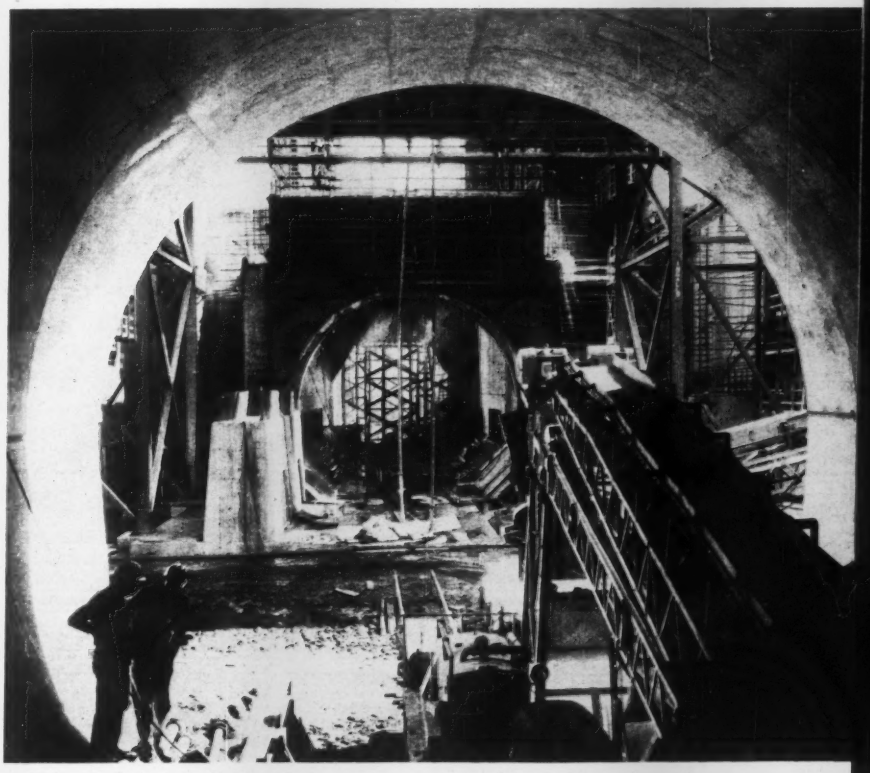
Moving the machine forward in the tunnel is a relatively simple operation.

When it is mining, the machine is supported near the front on two slotted feet that straddle the ring-beams laid on the floor of the tunnel. It is also supported near the rear on hydraulic rams riding on two rails spaced 18 ft c-c.

Two more hydraulic rams on each side of the machine hold it securely in place and move its undercarriage forward in 3-ft increments as mining progresses.

When the cutterheads have mined 3 ft of tunnel, the limit of travel for one setting, the supporting carriage is moved ahead. To do this, the weight of the machine is first transferred from the shoe that normally supports it to a second large hydraulically operated shoe directly over the center of track.

This shoe then raises the rig; and its undercarriage, which rolls on rails 18 ft c-c, is propelled forward 3 ft with a hydraulic ram. The lifting hoist is then retracted and the weight of the machine is transferred to the main shoe, ready for boring another 3 ft of tunnel.



Terminal conduit links downstream portal to surge chamber.

The Prairie Miner is electrically operated with power from a 2,300-v cable. Electric motors operate a 3,000-psi hydraulic system, which controls the operations of the big machine.

There are eight 1-cu-yd buckets around the periphery of the mining head. At the bottom of their cycle they scoop up loose material cut from the working face by the cutterheads. On reaching the top, they deposit the material through an opening onto a pan conveyor about 6 ft long.

Material from the 6-ft conveyor is discharged onto a 50-ft-long conveyor mounted on the mining machine, then on a 60-ft conveyor. The forward end of this third conveyor is suspended from the rear of the mining machine. The other end rides piggyback on a 30-in. main conveyor that extends to the portal. This belt has a capacity of 700 tons per hr and operates at 450 fpm.

A telescoping hydraulic crane mounted on the mining machine installed 8-in., 31-plf ring beams 3 ft c-c. The crane, in conjunction with an erection jig on the front of the machine, placed the ring beams, delivered in four sections, within about 3 ft of the tunnel face.

Here's how erection proceeded: The crane passed sections to the erection jig. Hydraulic rams pushed the ring section up above the circular jig, which was rotated by four electric motors. When the first section was in position, workmen rotated the jig about 90 deg and added the second section by bolting and welding fish-plates across the joint. Adding the third and fourth segments, completed the circle. A hand-operated "come-along" was used to place the ring-beam into final position.

Sixteen spreader bolts were installed between each pair of ringbeams, spaced equally around the entire circle. Workmen also installed steel mine ties at about 4-ft c-c, circumferentially, welded wire mesh for the pneumatically-placed mortar, and timber blocking as necessary.

Finish lining for the power tunnels is made up of 40-ft-long, 60-ton sections of welded steel liner plate. Resembling large cans, the liner sections are railroaded into place, welded and x-rayed. Finally, concrete is pumped

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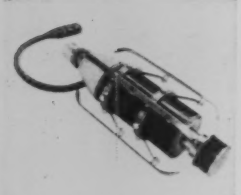

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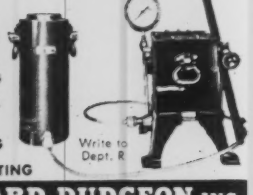

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into the 2.5 ft space between this lining and the primary lining of sprayed concrete. Finished inside diameter is 24 ft. The finish lining of all seven bores is scheduled for completion this October.

The downstream ends of the seven power tunnels connect with horseshoe-shaped conduits 72 ft long. These conduits join barrels of equal size and dimensions in a 40-ft-wide terminal structure which will pass water through the adjacent 167-ft wide surge-tank structure. From the surge chambers, water will feed directly to the turbines in the adjacent powerhouse.

The four mining machines used at Oahe represent a total investment of $1.8 million.

The first one, called the Mittry Mole, was used by Mittry Constructors to mine the upstream portion of the six 19-ft-dia outlet tunnels for flood control and river regulation (ENR Dec. 2, 1954, p. 24). Its two concentric, counter-rotating discs, which make a 24.75-ft bore, have a total cutterhead driving horsepower of 400. Total weight of the rig is 130 tons.

The downstream portions of these 3,400-ft outlet tunnels were driven in 1955-56 by the Oahe Constructors, using a mining machine called the "Oahe Mole." It is similar to the Mittry Mole except that it weighs only 90 tons and drives a 23.25-ft bore.

The upstream portions of the seven 3,600-ft-long 24-ft-dia power tunnels were driven and lined by Morrison-Knudsen-Kiewit-Johnson under a $13.4-million contract, which also included the intake substructure shafts. They completed mining a year ago, six months ahead of schedule, using a "Robbins Boring Machine."

The 200-ton machine was designed and built by James S. Robbins and Associates, designers and builders of its two predecessors at Oahe. It also makes a 29-ft 6-in. bore using a single cutterhead driven by eight 90-hp electric motors.

The Prairie Miner was designed by Prairie Constructors and American Hoist Pacific. It was built by American Hoist & Derrick Company.

Prairie Constructors' $25.2-million contract for the downstream tunnels is scheduled for completion in October of 1963.

Oahe Dam is being built under the supervision of the Omaha District, Corps of Engineers: Col. Harry G. Woodbury, Jr., district engineer; John W. Sibert, Jr., area engineer in charge of the project; Albert Arrington, project engineer on the hydropower works; G. L. Hammer, assistant project engineer on the tunnels; Sherman Williams, assistant area engineer. E. C. Sibert is project manager for Prairie Constructors.

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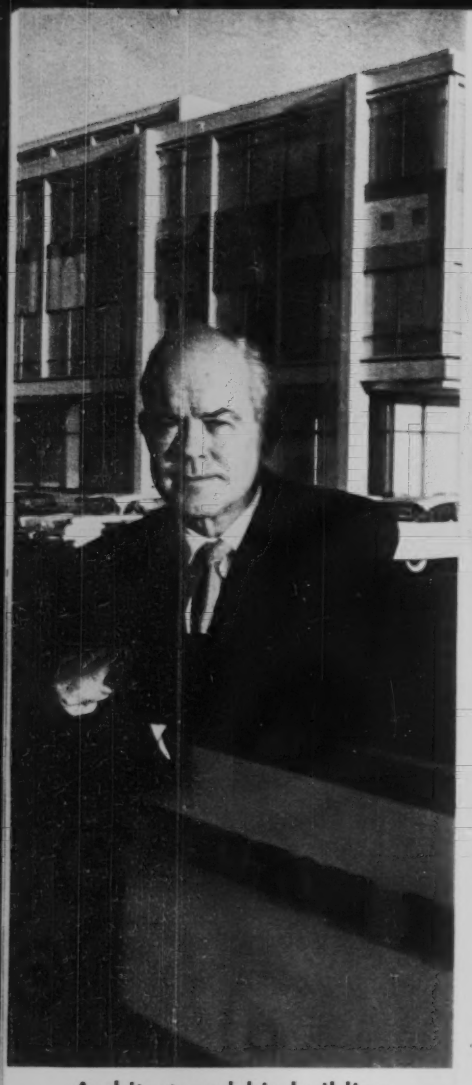


Architect and his building.

Gallery, largest of 16 conference rooms, is set up for exhibits.

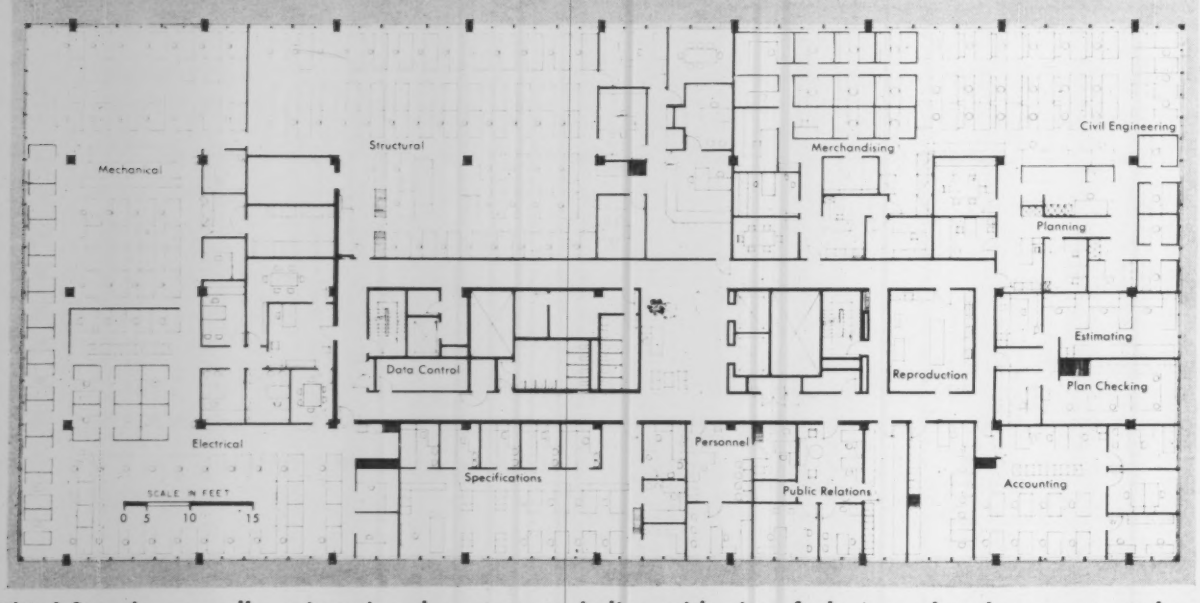
What a Top Architect

"If we had to do it all over again we wouldn't make too many changes." So said a satisfied client of architect Welton Becket last month at the dedication of a $3.5-million headquarters building in Los Angeles.

The client: Welton Becket.

The pleasure Welton Becket and Associates takes in its new quarters is roughly equivalent to a woman's pleasure in slipping out of a tight girdle. The firm had grown too big, too busy and too departmentalized for its former space. Last year it handled some $150 million worth of construction; that kind of volume meant squeezing 300 employees into 40,000 sq ft of floor space scattered untidily through seven floors of two adjoining buildings. Communication between design, production and engineering personnel became a struggle at best; worse yet, there was no room for the staff to grow.

In the new building, Becket employees enjoy 80% more work space. More important, the staff has grown 20% since the firm moved in last September. And from its new perch on the rim of the 20th Century Fox motion picture lot, the Becket organization looks out on the site of what will be a major Becket concern for the



Third floor houses all engineering departments, in line with aim of placing related groups together.

Production room—designed by architects for architects—provides work space for 115.

Wants in His Own Design Office

next 15 years—20th Century City, a $500-million, 260-acre apartment, hotel, office and shopping development, scheduled to begin this month.

After six months of living in it, Welton Becket, the client, is more convinced than ever that Welton Becket, the architect, produced a building ideally suited to the firm's highly integrated operations.

"What we were seeking mainly," Mr. Becket says, "was flexibility and a two-floor relationship in which all architects could be grouped on one floor and all engineers and specialists on another."

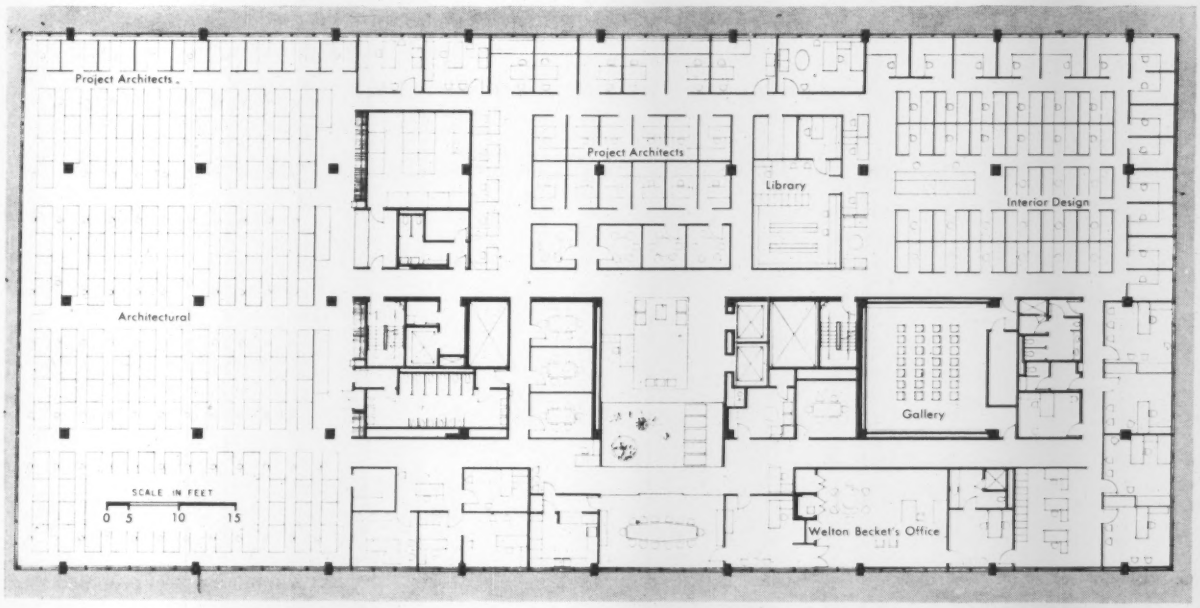
• **Outside**—The building is a five-level steel frame and reinforced concrete structure. Exterior is of glass and concrete curtain wall construction. Main aluminum mullions are finished in a white epoxy enamel, and secondary members are anodized in a gray-green tone. The facade is punctuated by exposed reinforced concrete columns, sprinkled with ornamental flecks of mica. Columns are spaced 29 ft c-c.

Becket took advantage of the sloping site to build the first story below ground. You enter the structure on the second level, where a concrete bridge spans a series of reflecting pools and fountains set in a landscaped forecourt.

The second level is set in from the 250 x 117-ft foundation. And the third and fourth levels, which are the hub of Becket's operations, are cantilevered 10 ft on each end. A fifth-floor penthouse houses a cafeteria.

• **Inside**—"Even if we'd had the space," Mr. Becket says, "it's doubtful we would have tried to get everybody on one floor." On a single floor you'd eventually be too crowded for efficiency, he says.

Starting with the two-floor relationship as a basic concept, Welton Becket



Fourth floor contains architectural production areas, main offices and most conference rooms.

. . . Where to place architects in an architect's office

called in the department heads and other key people for suggestions and for an estimate of their needs over the next five years. Flexibility, they decided, could best be achieved through the modular concept, which the Becket firm helped pioneer.

The designers determined that 29,700 sq ft, planned for 4-ft 10-in. modules, would be optimum for each floor. For maximum flexibility, they sized all offices, rooms and cubicles in some multiple of the modular dimension.

Partitions are specially designed movable panels. Lighting and air conditioning are also of special design to fit the modular pattern. Communications and power lines run in ducts between floors and can be tapped at a variety of places when offices must be rearranged.

Grouping the operations within two floors put functional departments within easy reach of each other. This is especially desirable in Welton Becket's "total design" method of architecture. The firm's projects frequently involve a complete and intricate integration of all factors, from basic economic studies, site selection and planning through architecture, engineering and design. The firm's design hand often touches furniture and fixtures, trademarks, napkins, and even uniforms for waitresses and hotel doormen, down to the buttons. Thus the operation demands a high degree of internal coordination.

With the arrangement of space in the new headquarters, Mr. Becket estimates that excellent communication between departments will result in a saving of $200,000 a year.

"That figure reflects not only a time saving," he says, "but, more important, the inter-department trips that might not have been made before are being made now."

All architectural services are on the fourth floor. A 12,879-sq-ft production room accommodates the complete 115-man staff.

Because the project architects are involved from inception to completion of any given contract, the designers paid particular attention to grouping offices strategically.

Each of the 25 project architects has a private office, either along the periphery of the production room or in a complex midway between the production room and the design department. These offices are also convenient to those of the project directors, who head each of Becket's five basic work divisions—office building, commercial, medical, institutional and hotel.

With a compact grouping of the architectural services, personnel can shift easily from one division to another as work loads fluctuate. This type of balance also permits Mr. Becket to steer architects into original design research when work slackens.

WELTON BECKET (standing) confers in his office with his top designers: Harry Widman, Carl Russell, Maynard Woodard (left to right, rear), Lou Naidorf (left foreground) and MacDonald Becket (right).

Offices of design director Maynard Woodard and other key designers are just across the corridor from the central compound for project architects.

Most design activities are carried on in a 68x58-ft room on the fourth floor. Dividers, 4 ft high, slice this section into rows of cubicles for the individual designers. This open arrangement encourages the exchange of ideas between interior and exterior designers.

The executive offices line up around the perimeter of the fourth floor, easily accessible to clients and vendors.

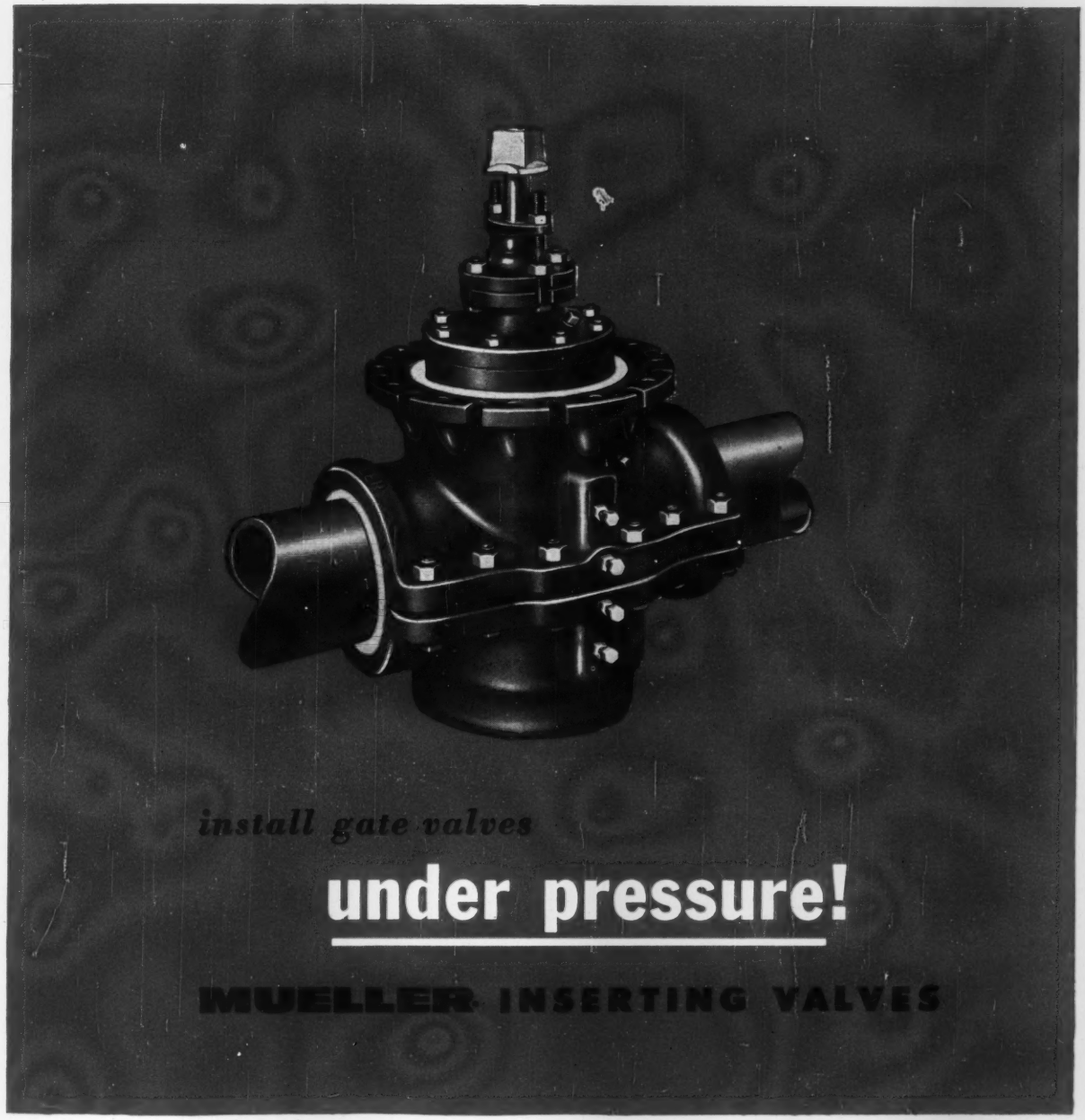
The fourth-floor lobby is frankly, forthrightly and unabashedly designed to impress visitors. There's a two-story-high court illuminated by a skylight, a blue mosaic tile reflecting pool with a circular planter and five sculptured metal fountains. Above the pool, a specially designed aluminum grill dangles from a translucent ceiling. A 9x30-ft sandcast mural makes up one wall of the lobby. Walls on either side of the pool are precast quartz panels. To get to the executive offices and the main conference room, visitors cross the pool on stepping stones.

Should the entrance prove insufficiently awesome, Welton Becket's own office provides the coup de grace. There, in a setting of teak panels from a razed 8th Century Buddhist temple, visitors take an armchair tour of the shop via closed-circuit television. Five cameras click on and off around the building. Mr. Becket has taken pains to inform his staff that the TV is not a Big Brother device. "Besides," he points out, "if anyone feels it necessary to look busy, he'll be warned by the red light that goes on when the camera is in use."

One of the pressing needs at the former headquarters had been a lack of space for staff consultation or for discussions with clients and vendors. The new building has 16 separate conference rooms accessible directly from the lobby area. (Becket feels strongly about unnecessary movement through the work areas. "After all," he says, "the basic commodity we have to sell is the time of our creative people.")

A 30x40-ft all-purpose gallery on the fourth floor can handle the larger conferences, movie screenings, exhibits, displays and mock-ups of proposed room sections. Specially designed brackets,

(*Story continues p. 64*)



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. . . Design office laid out to encourage teamwork

concealed in the wall when not in use, support renderings.

The third floor houses the engineering and administrative functions. Offices for chief engineer Paul Sessinghaus and for the heads of the mechanical and electrical engineering sections butt against a work area that extends the width of the building. This section accommodates 70 engineers, including a special section for design of kitchens.

Next to this area are the offices of Stacy & Skinner, an independent structural engineering firm that does about 50% of the dollar volume of Becket's structural engineering. Stacy & Skinner is a paying tenant.

Accounting and cost estimating are also on the third floor. (In the old quarters, these departments were three floors removed from the engineering group.)

With the move to the new building, Becket bolstered his staff of master planners from five men to sixteen, and added a new space programming department. These offices work in close coordination with civil engineering.

Merchandising, ideally, should have been on the same floor as architectural design. But the recent upsurge in store-planning activity necessitated almost 4,000 sq ft of space to accommodate the 40-man department, and there was no room on the fourth floor. Space was found for this group on the third floor.

Administrative offices, with mimeographing and other duplicating equipment, are grouped around the third-floor reproduction room.

Cost-control and plan-checking departments were placed next door to each other. The two departments work together closely. All working drawings require a minute scrutiny by the plan-checking department before going to bid. Any errors, which could have a significant effect on cost, can be transmitted immediately to the cost-estimating department, where adjustments can be made quickly.

• Functional equipment and tenants—Just as Welton Becket designed the interior arrangement to maximize efficiency and the exterior and entrances to impress his visitors, so he planned the mechanical equipment with an eye to educating his clients.

Electronic control of the building's plumbing, heating and air conditioning is achieved with a supervisory data center, which is in a glass-enclosed compartment next to the engineering offices. The equipment checks, regulates and records conditions in each section of the building.

"We use the unit experimentally as well as functionally," chief engineer Sessinghaus explains, "and it's also convenient for demonstrating to clients the newer developments in building-maintenance equipment."

INTERIOR DESIGNERS work in cubicles formed with 4-ft-high partitions.

In other ways also, the building serves as a pilot for innovations Welton Becket can apply to client projects. For example, the Humble Oil & Refining Co. office building in Houston has a double-duct air-conditioning system similar to that developed for the Becket building.

Lighting and air conditioning are integrated within each module in demountable acoustic-tile ceilings.

Low-brightness fluorescent fixtures, providing 120 foot-candles of light, are flush with the suspended ceiling. Each fixture is flanked by a slot on either side; conditioned air enters through one vent and return air exits through the other. Peripheral ducts, controlled by exterior solar thermostats on each side of the building, feed a curtain of conditioned air across the windows. There are individual temperature controls in each office.

The first floor of the building is occupied by "functional" tenants—Century City Blueprint Co., which does about 90% of Becket's blueprinting, occupies most of the rentable area on the bottom level; another first-floor tenant is a barber shop.

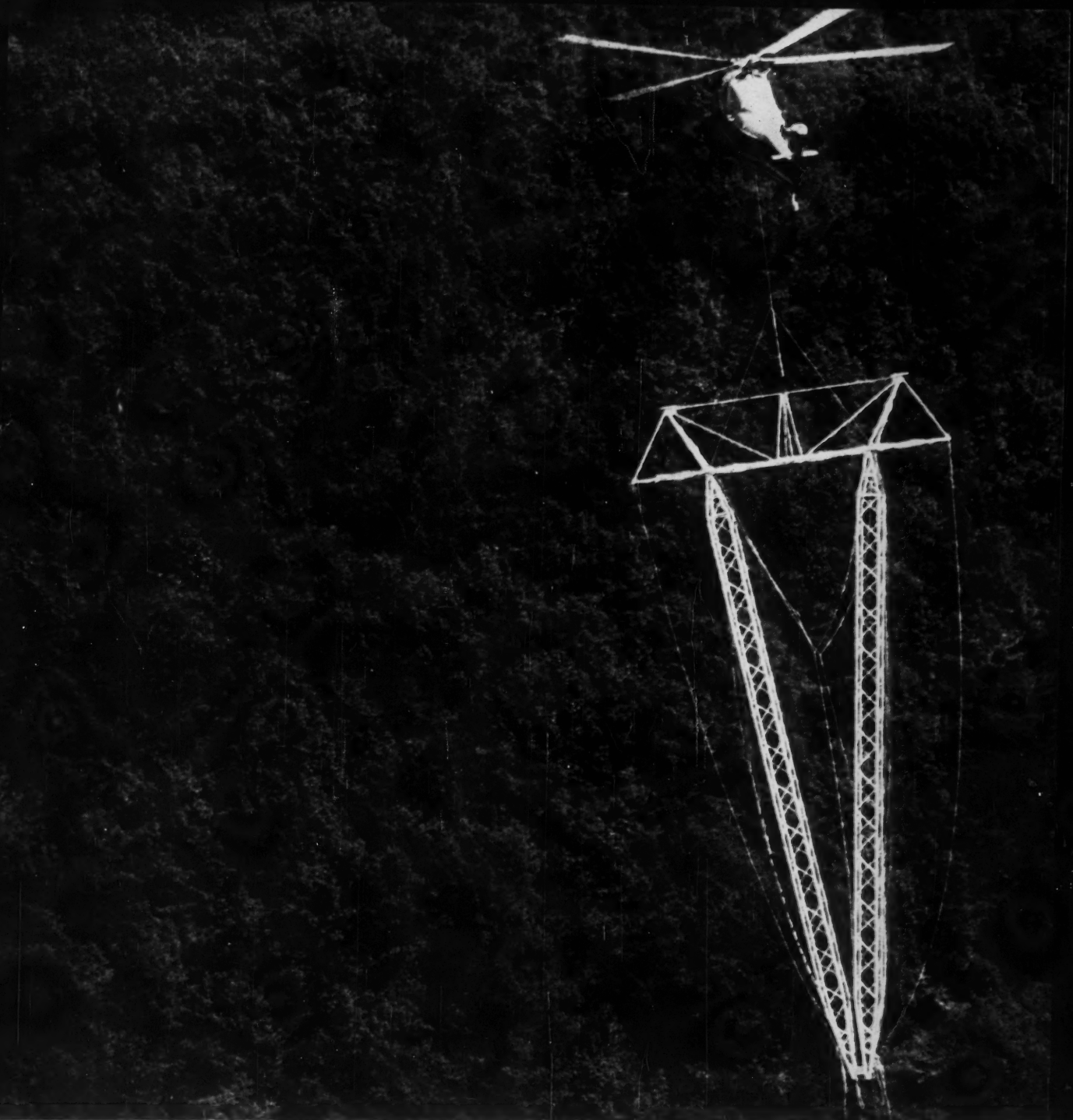
The second floor is rented to Pauley Petroleum Co. to "help protect investment in the building," Becket says.

"This not only gives us another form of income," he says, "but it's an ace in the hole if we have to expand."

• General practitioner—Though Welton Becket is noted for his office building design, which amounts to about 35% of his annual volume, the work handled by the firm is quite varied.

The organization dates back to 1932, when Welton Becket formed a partnership with Plummer and Wurdeman following his architectural studies at the University of Washington and L'Ecole de Beaux Arts in Fountainebleau. At first, the firm specialized in homes, later broke into commercial work on a small scale. In the late '40s, Wurdeman & Becket designed office buildings in Los Angeles for Prudential Life Insurance Co. and General Petroleum Corp. Those buildings established the firm's reputation. After Mr. Wurdeman's death in 1949, Mr. Becket carried on the practice as president.

Outside the office-building field, the firm recently designed a $10-million, 3,100-seat music center for Los Angeles and a medical center for the University of California at Los Angeles. The firm is also doing long-term master planning for UCLA and the Los Angeles and San Francisco airports.



One minute ago this aluminum tower left the marshalling yard

...in five minutes it will be standing on its foundation

In a history-making experiment in line construction, American Electric Power Company transported and erected a completely assembled V-tower by air.

The aluminum tower, designed for a 138-kv line, was airlifted at the assembly yard, flown 9/10 of a mile, set on its concrete footing, released, bolted and temporarily guyed—all in less than six minutes. With guys, the tower weighed 2,900 pounds—well within the capacity of the Sikorsky S-58 chosen for the job.

The demonstration, conducted by A.E.P.'s subsidiary, Appalachian Power Company, was but one phase of a six-week-long helicopter construction operation. The company used the Sikorsky S-58 to haul steel, poles and assembled H-frames...to erect tower panels ...to string cable. Carrying steel for 17 towers, for example, the helicopter completed what would normally be three weeks' work in just 4¼ hours. Total time to construct 29 miles of line was cut to one-third of that required with conventional methods.

For more facts on helicopter services and the new role of rotorcraft in line construction, simply write Sikorsky.

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100 TONS at 16′ RADIUS

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Now, with the new Manitowoc Model 3900, you get a *full 100-TON* lifting capacity at a practical *SIXTEEN FOOT RADIUS* with plenty of reserve power and stability. This means the 3900, already recognized in the field as the TOP lifting crane in its class, will lift 33% *more* than it did before. Check these new advances and see why a Model 3900 crane can make *more money* for you.

INCREASED LOAD CAPACITY AT GREATER RADIUS — With a 60-ft. boom, the 100-ton maximum load can be lifted at a radius of 16 feet.

NEW "INVERTED ANGLE" BOOM IS LIGHTER, STRONGER — Made of a special new alloy, the new Model 3900 crane boom features tubular lacings welded to *inner faces* of the main chords for greater strength and longer life. Boom weight is reduced, yet strength and rigidity are increased. You can use longer booms — up to 170′ — with higher capacities. Long reach tubular booms are also available.

SIMPLE BOOM INSERT CONNECTIONS with a single bolt at each joint permit fast in-the-field addition or removal of extra boom sections.

NEW 3-PIECE SELF-REMOVABLE COUNTERWEIGHT provides proper balance and ample stability. Carbody and rotating bed are matched to the demands of increased counterweighting and bigger work loads. As before, the counterweight is removed by the machine itself without the use of jacks, blocking or other cranes.

NEW "DYNAMIC LOAD CONTROL" DEVICE provides power lowering of full 100-ton load at lowering speeds comparable to hoisting speeds. The unit consists of a hydraulic retarder with heat exchanger, and a reversing mechanism with clutch and air controls. A chain drive interlocks main drum with the reversing mechanism which is located on the main drive shaft. The retarder, *not the engine*, absorbs load energy. Line speeds are controlled over a continuous range.

NEWLY ENGINEERED RETRACTABLE HIGH GANTRY reduces overhead clearance to a minimum when traveling. Gantry is quickly and easily raised or lowered by the boom hoist . . . no outside help is required.

NEW OUTSIDE POSITIONING OF CRAWLER DRIVE CHAIN permits crawler units to be removed for job-to-job transport without "breaking" drive chain or crawler pads. (Optional)

AUTOMATIC CLUTCH THROW-OUT LIMIT STOP for safe, close radius booming. This device *automatically* disengages boom hoist clutch when boom approaches a pre-set contact point . . . prevents operator from raising boom beyond safe limits. Also, physical-type pantograph boom stop is an additional safety feature.

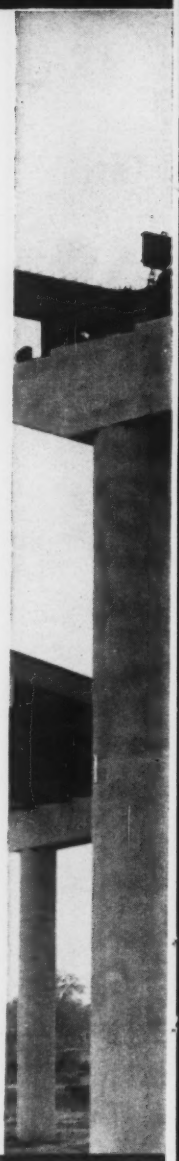
INDEPENDENT BOOM HOIST IS STANDARD — has air controls to give the operator greater precision in handling boom and load. Operator has positive control at all times. Available on air-equipped machines only.

WIDE RANGE OF CONTROLS gives operating versatility. Available with air controls *only*, or manual controls *only*, or as a combination machine with *both* air and manual controls.

INDEPENDENT SWING is available as a useful feature for placing steel and "tight quarter" maneuvering. Allows operator to boom, swing, and travel simultaneously.

COMPACT DIMENSIONS for easier between-job shipment. The crane can be carried on standard railroad flat cars, within ordinary rail clearances . . . removing only crawler units, boom, and back hitch.

These new and improved features are only a small part of the complete 100-Ton Model 3900 crane story. To learn about the many other advantages you can enjoy, including full convertibility to dragline or clamshell, visit your nearby Manitowoc distributor soon.



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Gentlemen: I'd like more information on your new 100-Ton Model 3900 crane.

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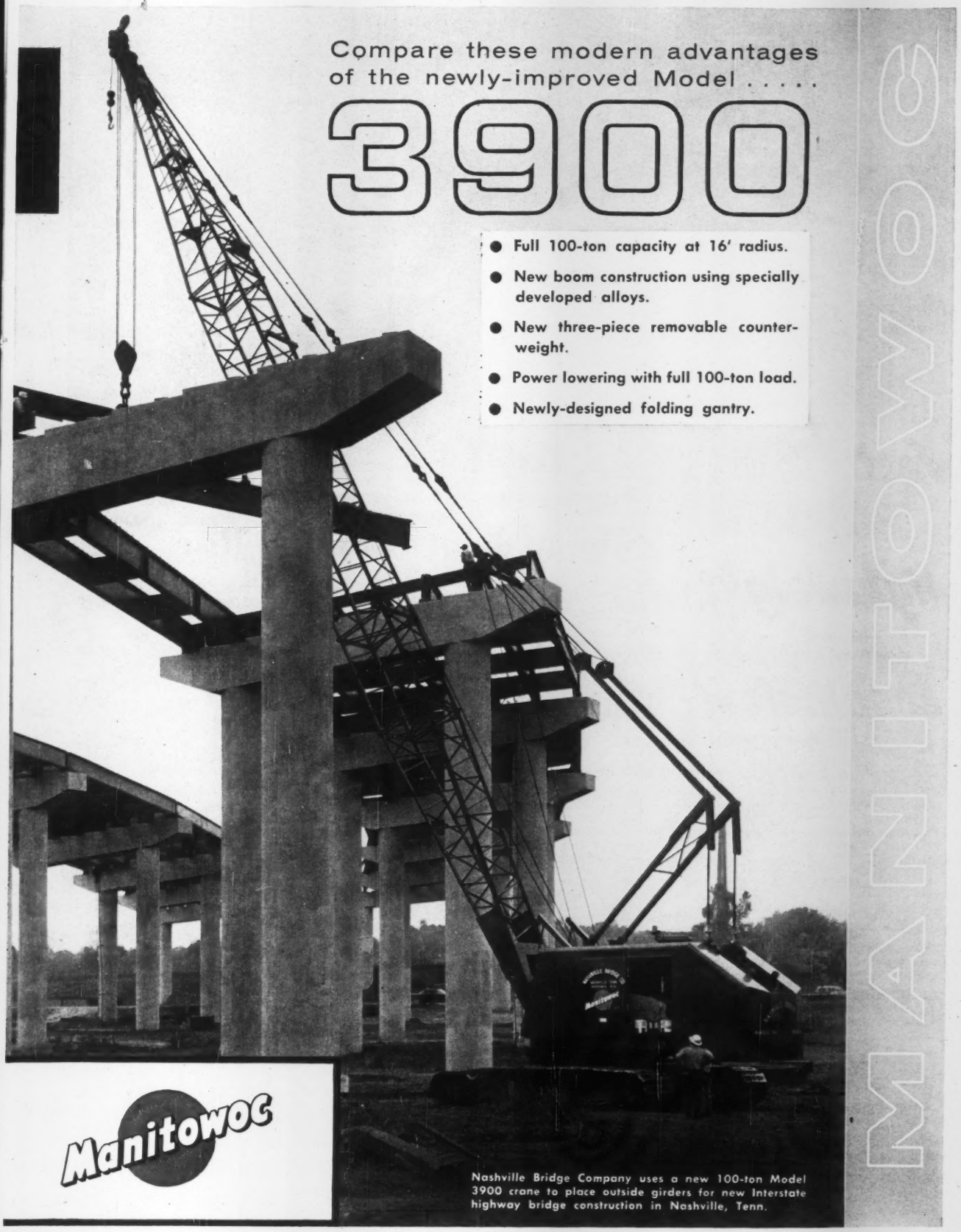
CRANES
25 to 125 TONS

SHOVELS
1¼ to 6 YDS.


Compare these modern advantages
of the newly-improved Model . . . . .
3900
● Full 100-ton capacity at 16′ radius.
● New boom construction using specially developed alloys.
● New three-piece removable counterweight.
● Power lowering with full 100-ton load.
● Newly-designed folding gantry.
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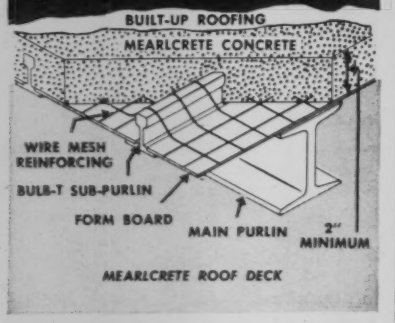
Manitowoc
Nashville Bridge Company uses a new 100-ton Model 3900 crane to place outside girders for new Interstate highway bridge construction in Nashville, Tenn.

MEARLCRETE *insulating* ROOF DECKS



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with complete data on Mearlcrete Foam Concrete and the name of your local Mearlcrete contractor.

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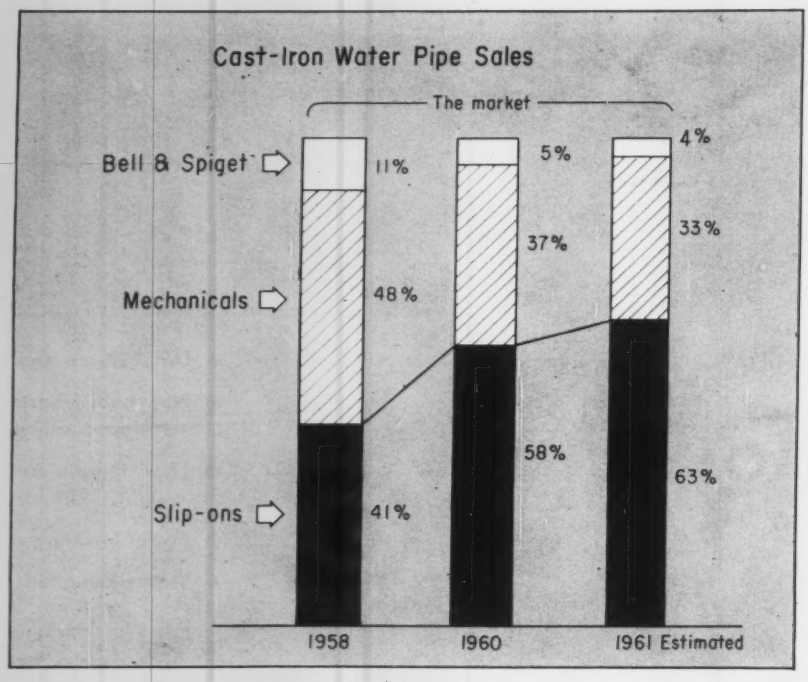
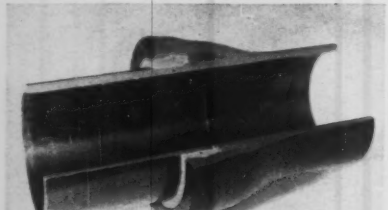


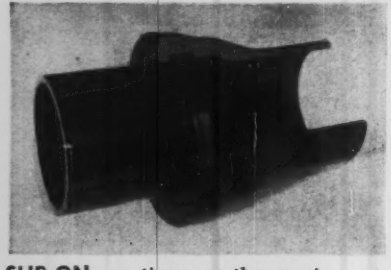
Cast-iron water pipe sales show . . .

Slip-on Joint Is on the Rise



BELL-AND-SPIGOT are down.

MECHANICAL joints less in demand.



SLIP-ON continues on the upswing.

Slip-on joints are still growing in popularity among buyers of cast-iron water pipe.

Leading manufacturers surveyed by ENR reported that 58% of the 1960 sales were for slip-on-joint pipe. Two years ago the figure was 41% (ENR Jan. 22, 1959, p. 53).

In 1954, when ENR surveyed the same manufacturers, slip-on-joint didn't even rate a mention. Today, its share of total sales compares with 37% for mechanical-joint pipe and 5% for the bell-and-spigot pipe.

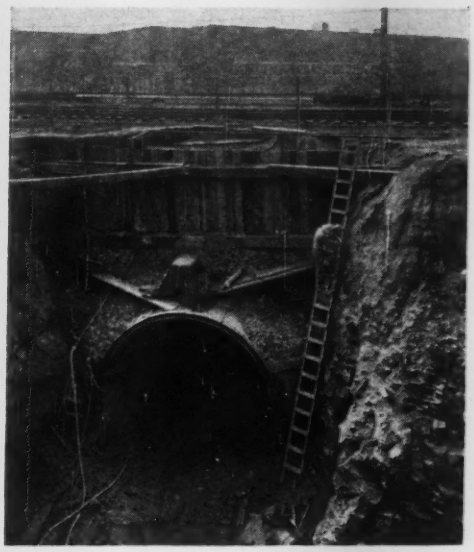
What's more, manufacturers expect slip-on-joint pipe to increase its lead still further. They predict its sales will rise to 62% of the total cast-iron water pipe sales in 1961 and to 68% in 1962. Both the other two types are expected to drop off in sales.

Slip-on-joint pipe or push-on-joint pipe, as some manufacturers prefer to call it, is available in sizes ranging from 2 in. to 24 in. Mechanical-joint pipe sizes go from 2 in. to 54 in., and the bell-and-spigot pipe is made in sizes up through 72 in. Most calls are for 6-, 8- and 12-in-dia pipe.

Although cost of materials for slip-on-joint pipe is slightly higher than for mechanical and bell-and-spigot pipe, installation costs are considerably smaller.

Laborers need not be highly skilled; the installation goes much faster, the pipe can be laid in muddy or wet trenches.

"PARTICULARLY VULNERABLE—PERFECTLY STEADY" in supporting Eighth Ward Storm Drainage Relief Tunnel, Linden, N. J. Tunnel supports serve as a protective shield to prevent breaking up of pre-cast concrete pipe lining until back-packing, grouting and disturbed ground conditions stabilize. Timber lagging, resting on bottom flanges, spaces ribs and provides overhead safety protection for workmen.



ROADBED UNDISTURBED—Blasting in Red New Brunswick shale with an earth overburden of only 15 ft. below the right-of-way presented unusual tunnel support problems. 80-car mainline trains on down grade bottom out above tunnel crown. Ribs support tremendous static and live impact loads plus terrific vibration caused by pounding of trains.

How to tunnel...

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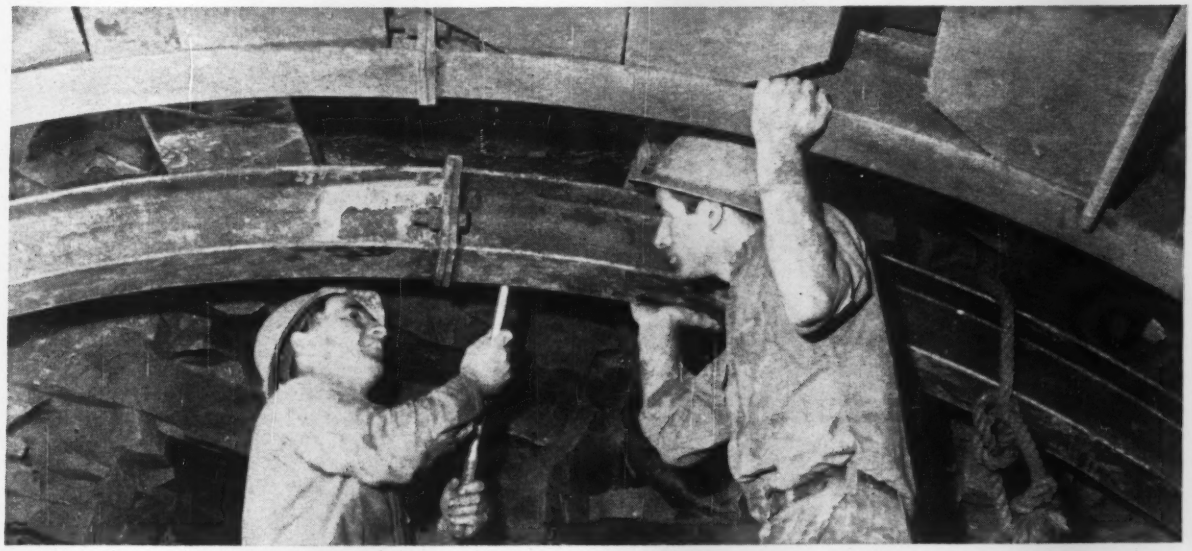

QUICKLY BOLTS INTO PLACE—COMMERCIAL 6" WF two-piece sets are joined at crown butt plates with quick acting bolts. Ribs, spaced on 3 ft. centers, are primary load carrying members. Note important blocking wedged between ribs and rock.

For complete information on how COMMERCIAL has aided others in the construction tunnels, vertical shafts or open pits, ask for Bulletin 300-P14. Address: Commercial Shearing & Stamping Company, Youngstown 1, Ohio. Attention: Dept. E-15

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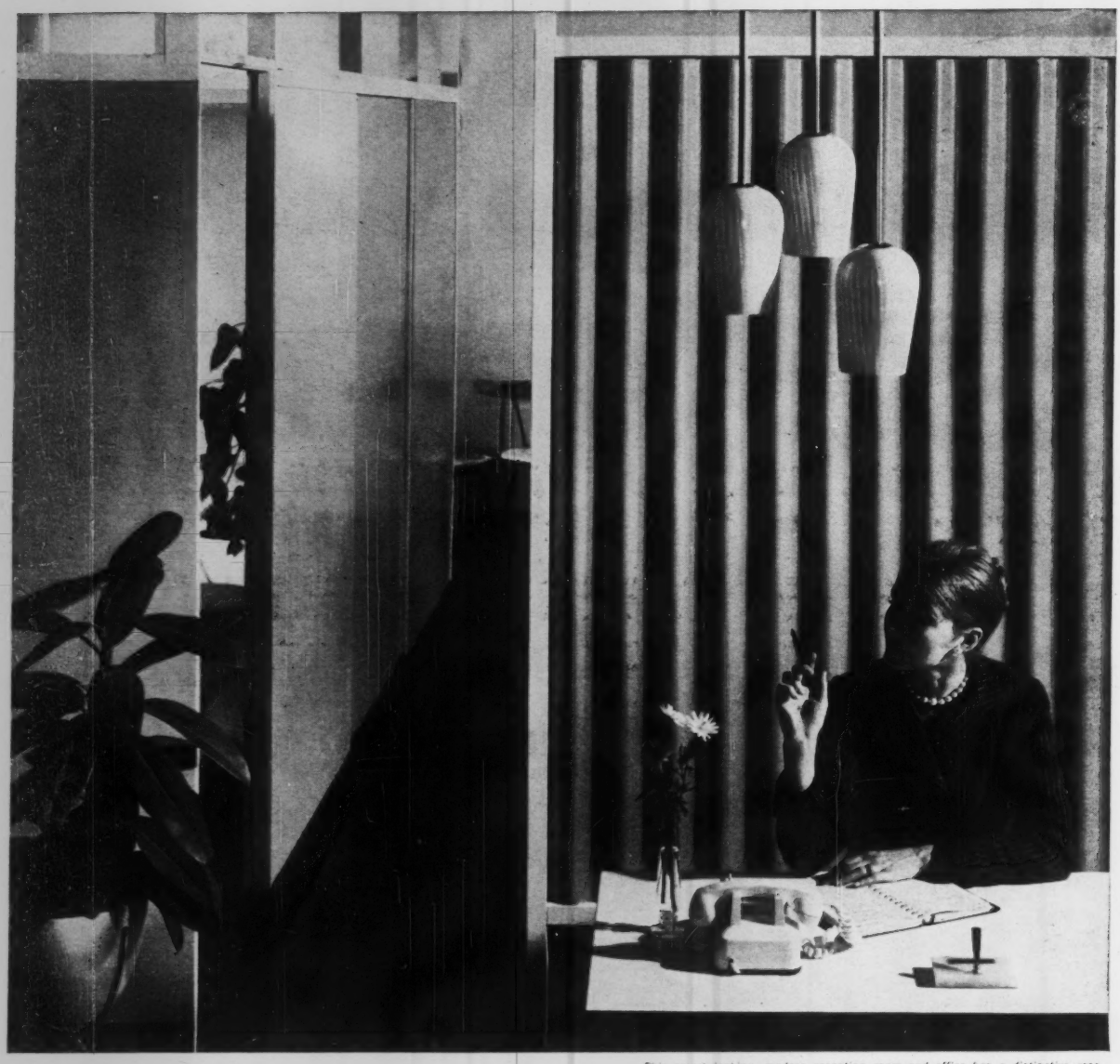

This smart-looking, modern reception room and office has a distinctive rose-colored China Blend "K&M" Corrugated Asbestos-Cement Panel, with partitions in bright yellow and bone white "K&M" Flat Sheets.

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Now, you can combine utility with decorative appeal by the use of "K&M" Asbestos-Cement Structural Sheets with the new "KolorMate" Finish.

These hardy, fireproof sheets retain all the ruggedness and durability of plain asbestos-cement sheets. However, 15 striking colors make them as good-looking as they are tough. They open up for you an unlimited range of decorative possibilities as siding, soffits, facades, marquees, office and shop partitions, and wall trim, to name but a few applications.

Under rigorous testing in K&M's research and development laboratories, these colors did not blister, peel, yellow or fade. Their "KolorMate" baked-on acrylic finish, developed exclusively for "K&M", bonds securely to the surface. This smooth, semi-gloss finish won't crack or chip during installation . . . can be scrubbed repeatedly without damage.

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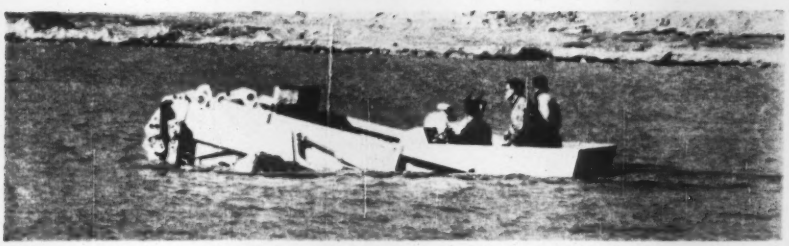
Research and Development

Crawler-Tractor Changes Into . . .

. . . A Carrier for Men or Cargo



. . . Then Into an Amphibious Vehicle

Contractors and Army Engineers may well find a wide variety of uses for a crawler-tractor being developed by International Harvester Co. at its Melrose Park, Ill. division under a research and development contract from the U.S. Army. A prototype of the machine—called "Universal Engineer Tractor"—is currently under test.

Driven by a 250-hp, V-8 gasoline engine, the 10-ton experimental crawler performs equally well as a dozer-tractor, a scraper or grader, a high-speed prime mover and a cargo carrier, according to the manufacturer. As a front-end loader it will handle a bucket with a heaped capacity of 8.5 cu yd. It is also designed as a personnel and weapons carrier.

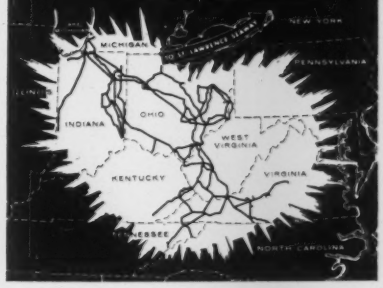
Because of a generous use of aluminum, the tractor can be dropped by parachute, is amphibious, can travel up to 4 mph in the water, and can do towing in water 6 ft deep.

It has a maximum drawbar pull of 17.5 tons when fully ballasted. It has a top ground speed of 30 mph, and a hydro-pneumatic suspension system, controlled from the instrument panel.

The machine is 18 ft 4 in. long, 9 ft 2 in. wide, and 6 ft 8 in. high.

Based on field tests of the first prototype, later models of the crawler will be powered by a diesel engine and will have a hydrostatic drive. Steering, braking and both forward and reverse motions will be controlled by a single lever.

ONE-STOP *FREE* "SHOPPING CENTER" FOR PLANT SITES IN 7 STATES



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American Electric's "shopping center" furnishes up-to-the-minute information on labor, raw materials, neighboring industries, taxes, water, transportation, recreation, living conditions and all other important factors.

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For more information or free brochures, "Power and Natural Resources" and "Plant Location," write or phone, in full confidence, to Mr. Lee L. Davis, Vice President, Area Development, Dept. S413, American Electric Power Service Corp., 2 Broadway, N.Y. 8, N.Y.

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Westinghouse delivers dependable power to first automated U.S. Post Office

(Below) Functional, clean lines of the Providence Post Office exterior are highlighted by Westinghouse OV-25 parking area luminaires, assuring 24-hour maximum security operation. The luminaires' horizontal housing and tilted optical system are completely sealed against dirt, moisture and bugs for years of low maintenance, high efficiency operation.

J-94161-1

The nation's first automated post office, labeled "Project Turnkey," is operating now in Providence, R.I. It represents the first step in the government's plan to make the complexity of mail handling completely automatic to insure 24-hour delivery of mail to any part of the country.

Behind the architectural beauty of this $20,000,000 facility is a vital electrical nervous system. And it's the sure, steady performance of Westinghouse electrical apparatus that keeps this marvel humming.

From dependable, maintenance-free outdoor luminaires that light the 14-acre site to 69 power and lighting panelboards that feed sensitive letter sorters, facing and cancelling machines, parcel post machine and conveyor system, Westinghouse products coordinate for the high degree

(continued on next page)

These 11 sorters distribute mail to bins for 300 separate destinations after an operator's key punch code has sent an impulse to the memory unit of the sorter. Other major machines in the system are six letter cullers, six facer-cancellers, two parcel post sorters, and over three miles of conveyors.

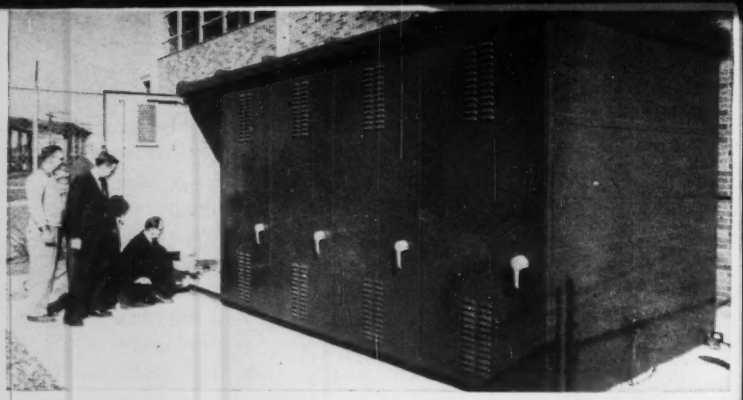
Owner: Intelex Systems, Inc. Architect-Engineers: Charles A. Maguire and Associates, Providence, R.I. General Contractor: Gilbane Building Company, Providence, R.I. Electrical Contractor: Brady Electrical Company, East Providence, R.I. Westinghouse Distributor: WESCO, Providence, R.I.

(continued from preceding pages)

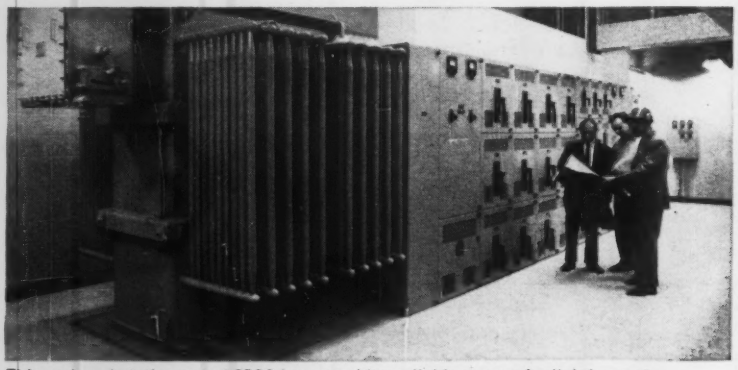
of service so important to this "Post Office of Tomorrow." It is estimated that 10,250,000 kilowatt hours of electrical energy will be required annually for the 24-hour operation of the plant.

The Gilbane Building Company, Providence, erected the structure for Intelex, a subsidiary of International Telephone & Telegraph, who will lease it and its mechanized mail processing equipment to the government for 20 years. Design was by Charles A. Maguire and Associates, Providence. Westinghouse personnel worked closely with the consulting engineer from design stages through completion. Experience and the completeness of the Westinghouse line earned this working role in mail handling history.

You can be *sure* . . . if it's Westinghouse!



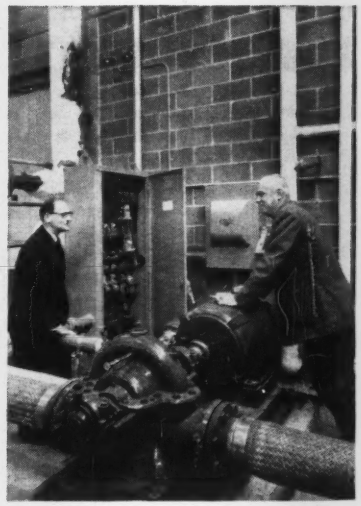
(Above) Rugged, weatherproof enclosure shields Westinghouse 150-DH-250 air circuit breakers which protect main feeders providing power to the post office. Inspecting breakers are A. A. Watson, W. W. Botts, R. W. MacArthur, and A. I. Israel (kneeling).



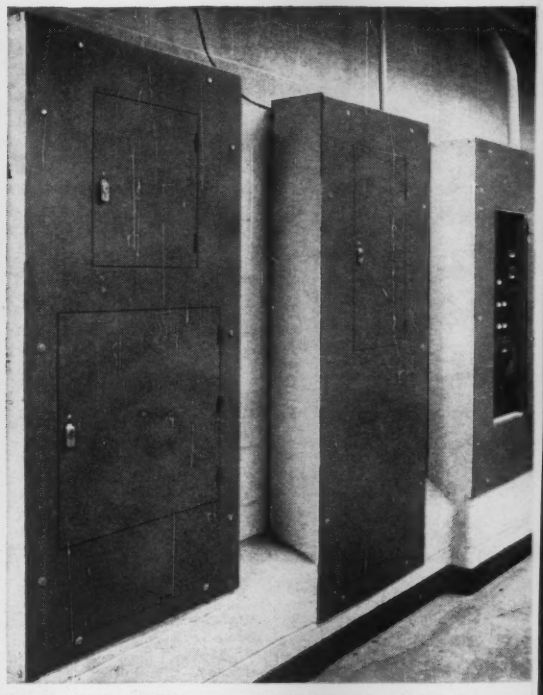
This main substation, rated 2500 kva, provides reliable source for lighting and power circuits. It receives incoming power at 11 kv directly from outdoor metal clad switchgear. Discussing schematic drawings of power circuits are: A. I. Israel, A. A. Watson and R. McCloskey, Resident Engineer, Charles A. Maguire and Associates.

(Below) Reviewing drawings during the construction of Project Turnkey are, left to right: Arthur A. Watson, General Foreman, Brady Electrical Co., Inc.; A. I. Israel, Charles A. Maguire and Associates; E. Howard Rohrbach, Project Manager, Intelex Systems; Richard F. Martin, Project Manager, Gilbane Building Company; R. W. MacArthur, Westinghouse; and Walter W. Botts, Manager WESCO, Providence.

(Above) A. I. Israel operates remote circuit breaker control panel for 15 kv outdoor metal clad switchgear as R. W. MacArthur looks on. Switchgear furnishes incoming power safely and efficiently to Westinghouse 500 kva power center serving post office auxiliaries. Compact design permitted location in minimum space, freeing valuable footage for work areas.



A. I. Israel, left, and W. W. Botts discuss operation of electrical system in mechanical building. In foreground is a 60 hp, 208 volt drip-proof Westinghouse motor, driving a chilled water pump. 400 amp safety switch on wall feeds an autotransformer reduced voltage starter which cushions inrush current to assure smooth pump start-up.



Westinghouse CDP power distribution panelboards equipped with De-ion® circuit breakers control and protect feeder circuits supplying power to intricate mail handling equipment. Complex systematized handling system requires reliable power supply since local failures would seriously impair movement schedules. Famed De-ion principle of arc quenching assures maximum circuit breaker life by preventing burning and pitting contacts.

Westinghouse

J-94161-2

Why this costly confusion about compaction?

First, let's agree that the only reason for compaction at all is to produce UNIFORM and ADEQUATE consolidation in the roadbed and surface courses *before* traffic is permitted.

And, as maintenance engineers can testify, if such prior compaction is not obtained, heavy tractor-trailers will further densify the structure: ONLY, THIS COMPACTION WILL NOT BE UNIFORMLY ACCOMPLISHED! The results will be channelized deformations that lead to costly repairs—running into millions annually.

All right? Then why specify or use rollers that cannot and will not produce compactive efforts equal to or greater than those produced by today's heavy over-the-road vehicles?

Here's where the apparent confusion lies—GROUND CONTACT PRESSURES!

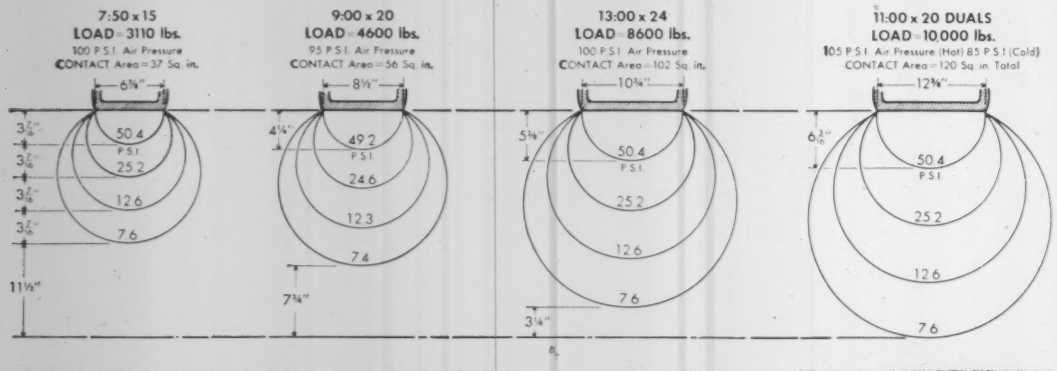
It's true that you can produce high ground contact pressures (GCP) with small size pneumatic roller tires —or for that matter, with steel wheel rollers—even greater than those produced by over-the-road vehicles. But GCP alone doesn't get the compaction job done.

To do the job, you must add these two most vital factors: WHEEL LOADS (Gross roller weight divided by the number of wheels), and GROUND CONTACT AREAS (GCA—Tire surface under load that's in contact with the ground).

If, then, you have the same GCA, GCP and Wheel Loads as over-the-road vehicles, you can expect to produce equal compaction forces.

But when you don't have this equality, the comparative diagram here shows the costly difference in compaction forces exerted.

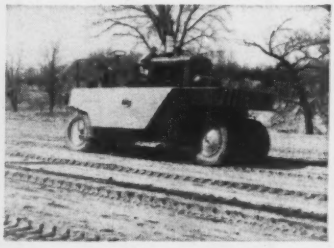
This clearly demonstrates why post-construction compaction leading to deformations occur, doesn't it?



Be mindful, too, that "heat rise" occurs in truck tire inflation pressures after approximately the first 50 miles of high speed travel, adding another 20 lbs. psi to further increase GCP . . . and, of course, also creating an even greater surface compaction force. And anyone who has heard the dishes rattle in the kitchen when a big truck rolls by can appreciate the vibratory effect that is set up in traveling at 50-60 mph speeds; this, too, adds to the consolidation by shaking down or repositioning particles in the grade, base and surface.

So it's plain to see why a properly designed roller must handle the compaction of our modern streets and highways.

But even if all of these important reasons for choosing the proper roller were ignored, there still is this paramount benefit: The large diameter roller tire permits compaction of grade, base and surface courses without "shoving," dozing or building up materials which can slow down or even stop other work operations.



To eliminate the costly confusion about compaction, today's rollers must do the same degree of compaction as over-the-road vehicles — only, do it FIRST!

Meeting *all* the challenges of today's compaction needs is the BROS Model SP-730B self-propelled pneumatic tire roller. Now available with Air-On-The-Run,* an advance that accelerates the building up of structural strength in weak soils for grade and base compaction; adding a hitherto impossible flexibility to roller performance on surface rolling, too.

Patent Pending

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Humps for a Trade School and . . .

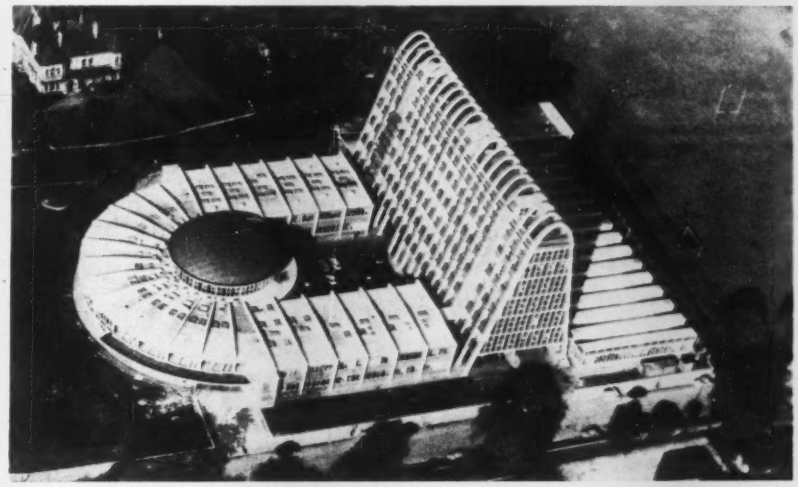
Parabolic arches vaulting from the ground over the roof, replace exterior columns in a seven-story tower for the Domestic & Trade Center, a school in Manchester, England.

The building's tapered vertical cross section solved a major problem faced by the architect: how to accommodate rooms of different size at each floor level.

The tower, which contains most of the classrooms in the center, is one of three units in the $1.7-million project. An adjoining two-story administration building, U-shaped in plan, surrounds an auditorium roofed with a shallow aluminum dome 70 ft in diameter. At the opposite side of the tower, a one-story building with a monitor roof spanning 80 ft houses workshops.

Space for parking and unloading is at ground level under the auditorium.

Twenty-three reinforced concrete arches, supporting the tower's six floors above grade, span the 70-ft building width at the ground floor. They rise 135 ft, topping the roof slab by 15 ft. Bay spacing of the arches along the 220-ft building length is 10 ft.



POACHED EGG AND TOAST RACK is the critics' name for the roof dome and the arch frames of the Domestic and Trade Center in Manchester, England.

A single row of interior columns stops at the third floor. Above that level, reinforced concrete girders span the building.

Leonard C. Owitt, Manchester city architect, designed the project. Structural engineer was L. B. Mouchel & Partners, London. J. Gerrard, Ltd., of Swintton, Lancashire, was general contractor.

. . . Bumps for an Opera House

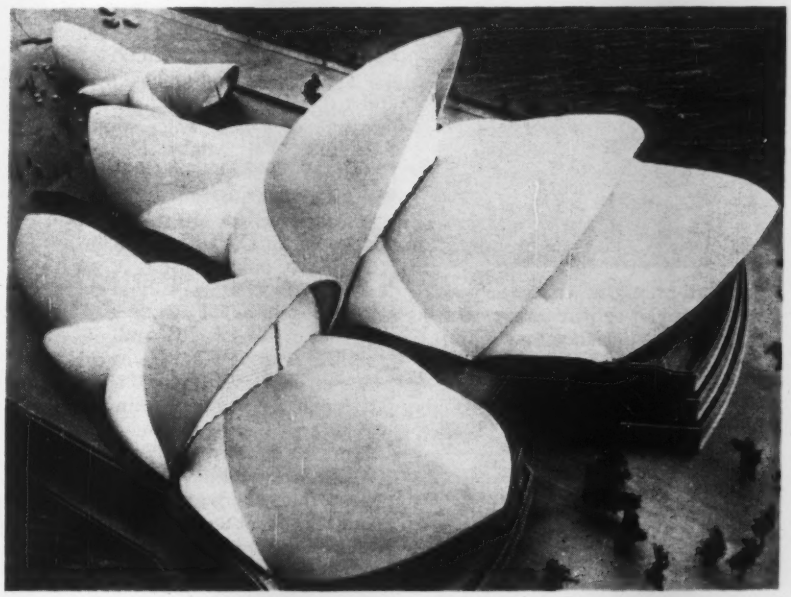
An unusual opera house under construction at the harbor front in Sydney, Australia, features a roof that is composed of intersecting, double-curved concrete shells faced with white ceramic tiles. They are supported on 70-ft-high concrete columns.

The building is roughly 600 ft long by 380 ft wide and will rise 230 ft above street level. The structure will be supported by 550 foundation piers; 50 of the piers will be placed in the harbor on both sides of the site where they will support the opera house's 30-ft overhang.

Concrete folded plates spanning 120 ft form the support for a grand concourse extending 400 x 600 ft along the opera house site.

Seepage from the harbor is prevented by the use of 18-ft-square cofferdams. These are made of steel sheetpiles, which were driven to rock, at an average depth of 25 ft.

The design was selected in an architectural competition. Joern Utzon of Hellebaek, Denmark, designed the prize-winning structure.



DOUBLE-CURVED CONCRETE SHELLS supported on 70-ft-high columns will roof a waterfront opera house in Sydney, Australia.

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Record Bridge Arch Closed

British steelworkers have closed the arch of the world's third-longest steel arch bridge, the Runcorn-Widnes Bridge over the River Mersey and the Manchester Ship Canal in western England.

Completion of the two halves of the $8.4-million bridge left an anticipated gap of 18 in. The builders closed this by releasing the anchor cables that supported the two halves and jacking up the ends of the span.

The arch span of the Runcorn-Widnes Bridge is the longest in Europe at 1,082 ft. It's exceeded only by those of the Sydney Harbor Bridge (1,650 ft) and the Bayonne Bridge (1,652 ft) between New York and New Jersey.

When it is completed next year, the bridge will link the industrial areas of Lancashire and Cheshire Counties.

The steel arch bridge has a total length of 1,582 ft and 4,400 ft of approaches. More than 5,600 tons of steel went into its construction.

Mott, Hay & Anderson designed the bridge. Dorman Long (Bridge and Engineering) Ltd. has the main contract.

Warragamba Dam Nears Finish

Sydney, Australia, has nearly completed Warragamba Dam, principal feature of a new water supply project on the Warragamba River in New South Wales.

The dam is a straight concrete gravity structure 450 ft high and 1,500 ft long. The project includes a 50,000-kw powerhouse.

The reservoir will hold some 460 billion gallons of water and provide a daily yield of 285 million gallons. Warragamba's storage capacity plus that of five other reservoirs in the system will get Sydney through a drought as severe as its worst on record (1934-42), with a year's supply to spare.

Over 1.5 million cu yd of concrete went into building Warragamba Dam and its 300x300-ft spillway apron. The dam is 340 ft wide at the base and tapers to a width of 28 ft near the crest. It has four 7-ft-dia water supply outlets. A 14-ft-dia penstock supplies water to the power station.

The spillway is overflow type, 310 ft long. It is controlled by four 40x40 ft radial gates and a single drum gate 90 ft long by 25 ft high. Design capacity is 450,000 cfs.

Japan Plans Big Year For Dam Construction

Japan's Construction Ministry reports that during 1961 the government will spend $57.5 million on dam construction. Plans include starts on eight new dams and survey work on six more.

The largest portion, $40.1 million, is for construction of multipurpose dams—continuation of 13 projects already under way, two new starts, and survey of a new site. The remaining $17.4 million will subsidize prefectural government dam construction. This involves continuation of 15 dams, six new starts and surveys of five new sites.

The 1961 appropriations represent an increase of 5% over last year.

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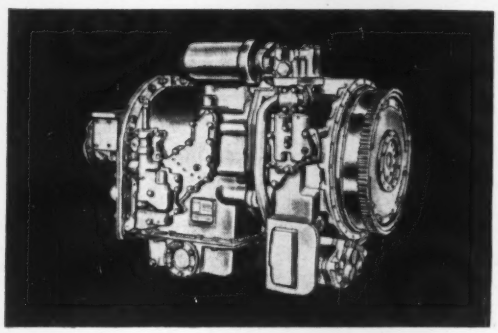
IN 80-TON COAL HAULERS–

Two of these LeTourneau-Westinghouse TORQMATIC-equipped LW-80 coal haulers replaced five 26-ton trucks at a Kentucky coal mine. "Even in wet weather and with 90-ton loads," the company reports, "the TORQMATIC units get underway slow and easy. A transmission like this that can take up the shock and, at the same time, give us the full benefit of 525 horsepower is bound to cut our maintenance costs to a minimum."

IN BIG LOGGING TRUCKS–

This Kenworth Model 849 logging truck is big as all outdoors, yet drives about as easy as a small pickup. Reason? Its Series 5000 TORQMATIC Converter-Transmission team takes the guesswork out of shift-work, eliminates the clutch pedal, is so simple to operate that the newest drivers look like "pros" after a day at the wheel.



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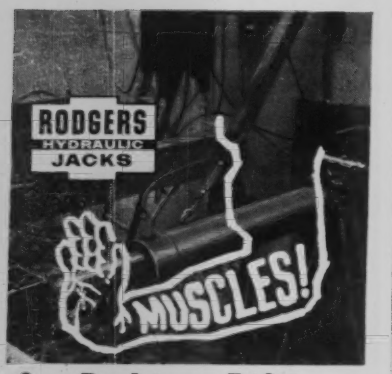

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Building Sports Steel Suspenders

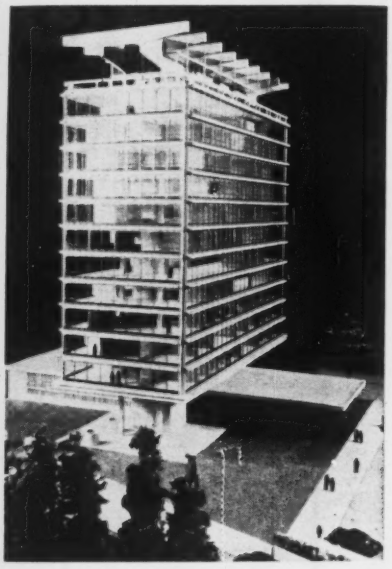
Steel cables from rooftop concrete cantilevers will form the exterior supports of the frame of a 12-story headquarters building for BP Belgium, a subdivision of British Petroleum, in Antwerp.

The building's architect, Stijnen, De-Meyer & Reussens of Antwerp, based their design on use of steel and concrete to the best advantage in tension and compression, respectively, to get the greatest amount of column-free office space with the least perimeter wall obstruction.

Construction has just started on the headquarters. Between 400 and 500 employees will occupy the glass-walled structure when it is finished late next year.

A pair of reinforced concrete shafts for elevators, utility risers and stair wells form the building's main support. This central core rises from a 40-in.-thick foundation mat 20 ft below grade. At the top—170 ft above ground—concrete cantilevers extend to the exterior walls. From them are hung a total of 22 high-strength steel suspenders, which support the outer ends of all floors above the first.

Inside the office building, modular planning based on 4-ft units, together with movable partitions, will allow flexibility in floor layout. Air conditioning, lighting and light baffles at exterior walls will be controlled on a modular basis throughout each floor for individual office control.



Roof supports hanging building.

Parking will be in lots scattered through a 75,300-sq-ft green belt around the headquarters. A small basement garage inside the building will handle 25 cars.

Structural engineers for the project are Societe Cockerill-Ougree, Liege, and Bureau Constructors, Antwerp. Algemene Ondernemingen Wwe Jerome van Coille, Osterde, Belgium, is the contractor.

Back to Work on Urubupunga

Preliminary work is under way on Brazil's Urubupunga hydroelectric project on the Parana River. Financing arrangements are anything but firmly established, but the State of Sao Paulo, richest of seven states joining forces to build the $400-million project, has started things rolling with a $10-million appropriation.

An airstrip and access road have already been built to the site of the smaller of the two dams planned. Presently 900 men are at work on the diversion cofferdam and canal.

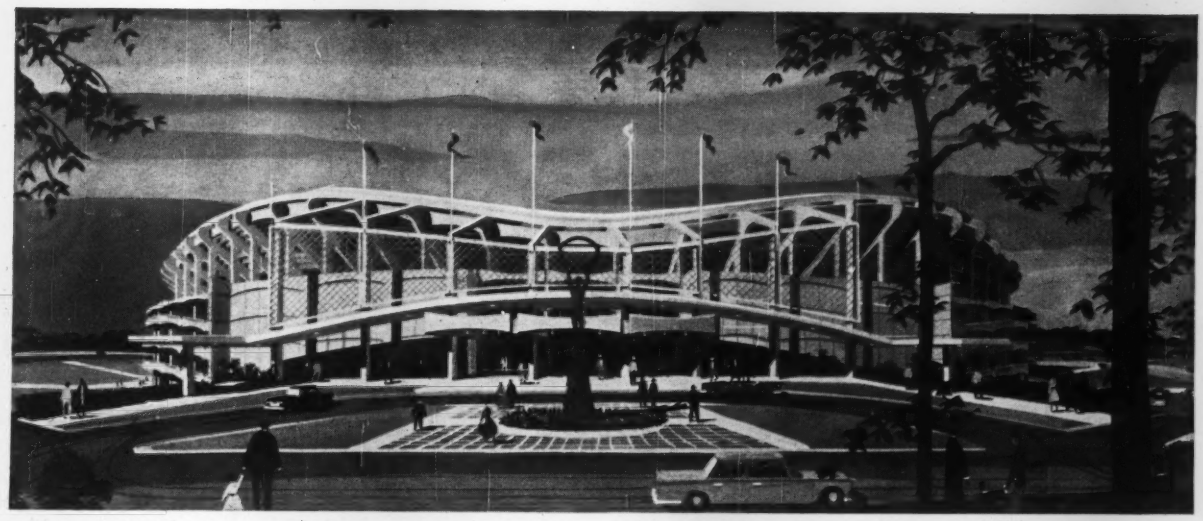
Six years ago the states—Sao Paulo, Matto Grosso, Parana, Minas Gerais Santa Catarina, Goias and Rio Grande do Sul—formed a commission, hired an Italian firm to design the project, and agreed to put up the money.

But the scope of the program, which involves two dams each with million-kw-plus powerhouses, cooled some of the enthusiasm, particularly on the part of some of the less prosperous member states.

The start of preliminary construction in advance of financing for the over-all job will save a year's construction time by completing river diversion ahead of high water this year. In the meantime local-currency financing will be arranged —some funds coming from the states, some from the federal government. A World Bank loan is hoped for and there is also a possibility that foreign utility firms may be asked to participate.

Although the $400-million cost estimate is considered conservative even now, it is very likely that at least one of the plants will get built.

The proposed dams are relatively low —one at Jupai will be 85 ft high, 1,650 ft long; the other, 20 miles upstream, will be 115 ft high but it will stretch an imposing three miles across the valley at Ilha Solteira. Powerhouse capacities: 1.3 million kw and 1.7 million kw.



Circular stadium in nation's capital to rest on steel H-piles

A double-decked $19,800,000 stadium to seat approximately 50,000 football fans and 43,500 baseball fans is under construction in Washington, D.C. To support the structure, nearly 6,000 tons of Bethlehem H-piles were driven to 50-ton bearing in a circular pattern.

Steel H-piles, used more than ever for the foundations of major buildings and other structures, are economical because they carry high loads per pile with a liberal factor of safety.

Bethlehem produces a full line of both sheet piling and H-piles. Ask the nearest sales office for free copies of our piling catalogs or write to us at Bethlehem, Pa.

Stadium owner: District of Columbia Armory Board; *Architects and engineers:* Dahl-Ewin-Osborn (George L. Dahl, Dallas, Tex.; Ewin Engineering Associates, Washington, D.C.; The Osborn Company, Cleveland, Ohio; associated for this project); McCloskey & Company, builders.

Nearly 6,000 tons of Bethlehem steel H-piles were driven to support the new stadium.

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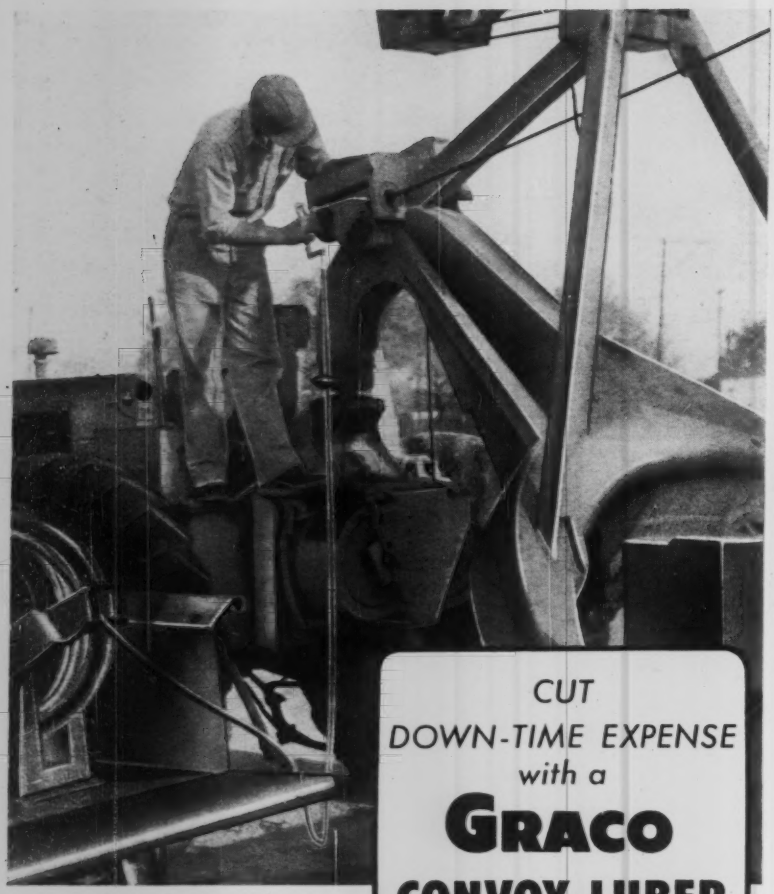

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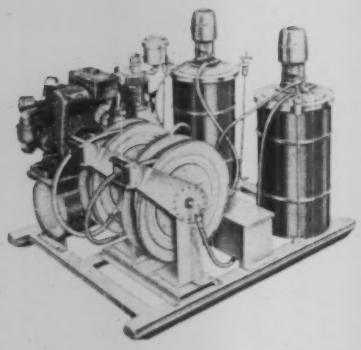

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Lighthouse Gives Tourists Lookout Over Tokyo Bay

A steel marine tower built atop a five-story reinforced concrete building in Yokahama rises 347 ft. The tower will be used as a lighthouse for the Japanese Maritime Safety Agency and for observation of scenic views around Tokyo Bay.

The 10-sided structure can be seen 21 nautical miles away when its red and green flashes go out at 20-second intervals during the night. The tower was designed and constructed by Shimizu Construction and Engineering Co. at a cost of nearly $1 million.

Masons Start at the Top Then Build Wall Downward

Masons are building the brick curtain walls starting from the top story and working down through the building at an apartment house project in Sydney, Australia.

Reinforced concrete floor slabs cantilever beyond the outside wall face and double as a work platform, thus eliminating costly scaffolding. The slab projections also enable the masons to continue working in the rain.

The top-to-bottom operation eliminates staining of finished walls by mortar droppings falling from above. Final clean-up becomes a quicker, cheaper job, and completed floors are less liable to suffer accidental damage, since workers are not constantly walking through them.

General contractor on the $1.8-million project is Wildman Constructions Pty. Ltd. William E. Beck & Associates are the architects; Taylor, Thompson & Whitting are the consulting engineers.

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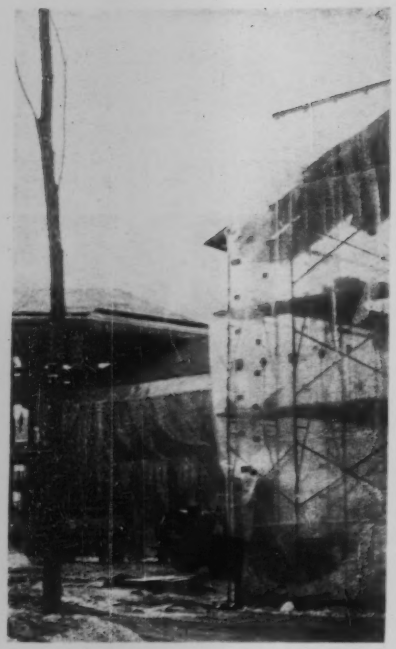
Contractor capitalized on spreadout plan and fickle weather to speed construction.

Winter's Plan Pays Off This Spring



Cold remedy: enclose a wing.

The contractor for a low, sprawling convent in Connecticut is nearly a month ahead of schedule after moving his work crews around like chessmen to get the most construction out of the winter season just past. Through the winter, temperatures varied from the 40s to below zero. Moving workmen between protected and open parts of the job as the thermometer jumped up and down, he kept work going without the high cost of winter protection for the entire project.

The project is a $3.5-million motherhouse and novitiate for the School Sisters of Notre Dame in Wilton, Conn. It will have 160,000 sq ft of floor—mostly on two levels to stay within local code height limits.

The architect-engineer laid out a large pentagon building surrounding an interior court. The building has five wings at its vertices. Construction is reinforced concrete with brick exterior walls and slate roofs on wood roof decks.

The pentagon and three wings were framed and partly enclosed before winter came.

With two objectives in mind, the contractor enclosed one entire residence wing with heavy plastic tarpaulins: It would keep the company's work force intact to handle completion of the job in spring and summer without need of breaking in new crews to the detailed institutional work. At the same time, the owner and the contractor wished to keep employment up through the winter in what has been a relatively high unemployment year for the area.

Perimeter of the enclosed wing is 571 lin ft. In about 100 man-hours, the builder hung 22,500 sq ft (75 sheets) of plastic tarpaulin over tubular steel scaffolding. Cost of the 20-mil-thick material was about $3,000. Hanging cost totaled about $500.

Temperature for the enclosure was supplied by two gas-fired blowers. The contractor says the wing stayed between 40F and 50F with temperatures as low as 10F outside.

Fletcher-Thompson, Inc., Bridgeport, Conn., is the architect-engineer. E & F Construction Co., Bridgeport, is the general contractor. A. H. Harris & Son, Inc., New Britain, Conn., supplied the Canadian-made Polytarps for the building enclosure.

NEVER BEFORE SIX-WHEELERS WITH HIGH-POWER, EXTENDED-LIFE V-6 OR TWIN-SIX GAS ENGINES!!!

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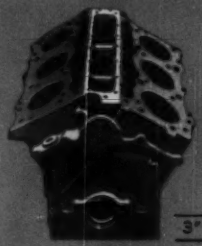
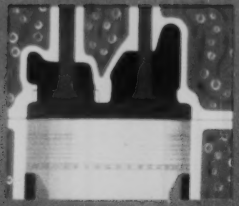


BLOCK DEFLECTION VIRTUALLY ELIMINATED with short, stiff design, 3-inch drop skirt, generous inner ribbing and staggered cylinders . . . everything for more strength and rigidity.



INCREASED VALVE AND ENGINE LIFE. Temperature varies less than 4 degrees throughout entire engine. Up to 176 gallons of coolant circulating every minute does away with damaging "hot spots".

EXCLUSIVE GMC V-6 POWER!

Here is the proved six-cylinder principle in a more compact, stronger and easier-to-service engine. Top hauling power over a broad, low rpm range makes rugged, heavy, off-highway construction work easy and permits top-speed highway hauling . . . saves damaging, costly wear and adds to fuel economy. Fully-machined combustion chambers assure precise combustion balance. Cam lobes dip in oil to prevent scuffing, scoring and galling. Short, separate intake inlets provide equal fuel-air mixture for smoother, maximum power from every drop of fuel. Spark plugs are located inside the 60 degree "V" for longer life. Extra-big sodium-filled valves with positive rotators are the best available. Servicing is more convenient with plenty of space around engine. See your GMC Dealer for all the life-extending, profit-producing advantages.

Complete one-stop parts and service is available at every one of nearly 3000 GMC Dealers. For the one nearest you, see the Yellow Pages.

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Equally loaded axles and
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CONVENTIONAL IN NAME ONL

PRICE These new 105" BBC Conventional Series are
lowest-priced six-wheelers built by GMC . . . surprisingly
buying cost, surprisingly low owning cost.

PERFORMANCE Exclusive 401 V-6 truck-built engine has
most torque of any comparable engine . . . and over a broa
lower, life-extending rpm range, too.

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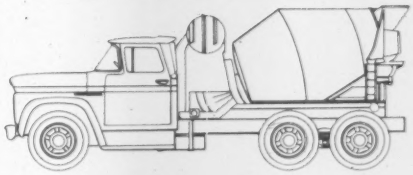
DEPENDABILITY V-6 engines can't be beat. Cabs with double-walls and solid-armor structure can take the most rugged construction usage day after day, year after year. Every truck must pass over 1000 rigid, detailed inspections. And every one is tested on the road for superior construction before it is released from the factory.

CONVENIENCE It's an easy, convenient step in and out with low cab floor height . . . less awkward, less tiring for the driver. Hood is extra-wide and full-opening to make inspection and maintenance easier and quicker.

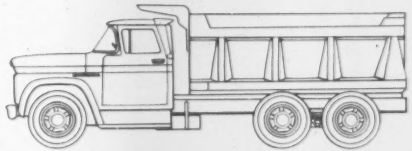
QUICK FACTS—CONVENTIONAL SIX-WHEELERS

SERIES	W5000	W5500
GVW	35,000-**37,000** lbs.	43,000-**48,000** lbs.
GCW	50,000 lbs.	60,000 lbs.
AXLES—FRONT	7,000-**9,000** lbs.	9,000-**15,000** lbs.
REAR	28,000 lbs.	34,000 lbs.
BRAKES—HYDRAULIC	953 sq. in.	—
FULL AIR	**943 sq. in.**	1100 sq. in.
ENGINE—V-6 GAS	351 cu. in. 180 hp.	401 cu. in. 210 hp.
	401 cu. in. 210 hp.	—
TRANSMISSION	5-speed direct	5-speed direct
	3-speed aux.	**4-speed aux.**

Equipment in bold type is optional



Here are just two of many popular uses of GMC Conventional six-wheelers.



PULL

ng to prove why GMC six-wheelers are your best construction hauling buy. Contact him today.

Get the most "Go" ever packed into a big-load 90" BBC! With the exclusive Twin-Six under the hood, working ability cannot be surpassed. Top loads and profits are yours, too, with ratings from 45,000 lbs. GVW to 120,000 lbs. GCW.

UNDISPUTED HAULING

Greatest load-moving power of any standard equipment gas engine . . . that's GMC's exclusive Twin-Six! You get highest usable torque and horsepower over a longer, lower rpm range . . . great reserve power to haul loads at part throttle under normal conditions, using reserve only for hills. Results: amazing fuel economy, gear shifting reduced up to 60%, higher sustained road speeds and greatly increased engine life.

Displacement	Max. Torque Range	Max. Horsepower
702 cu. in.	625-630 @ 1400-2100	275 @ 2400

SUPERIORITY

Short 90" BBC dimension and 28" front axle location provides better weight distribution for bigger loads; less over-all length and shorter turning circles, too.

CHOICE OF TANDEMS

You can get high tensile steel or heat treated full-depth frames with reinforcements for every load or use . . . dependable, lasting load-carrying ability.

Improved truck control, more load and road stability are the result of GMC's wider tread, wider spring centers and new steering setup. Capacity—11,000 lbs. standard and 15,000 lbs. with power steering optional.

Diesel-powered 80" BBC GMCs are popular construction trucks. And justifiably so with the V-6 diesel that produces more power per dollar, per pound, per cubic inch displacement... plus many more money- and hour-saving advantages. Your GMC Dealer is the man to see for complete data.

Three Ways to Store A-Wastes

Nuclear wastes, sometimes lethal and always a potential hazard, are stored in three separate facilities at Knolls Atomic Power Laboratory (KAPL) operated for the AEC by General Electric.

The wastes are segregated on the basis of their potential hazard measured in rems (roentgens equivalent man), a unit that summarizes the total biological effect of radiation absorbed by tissue.

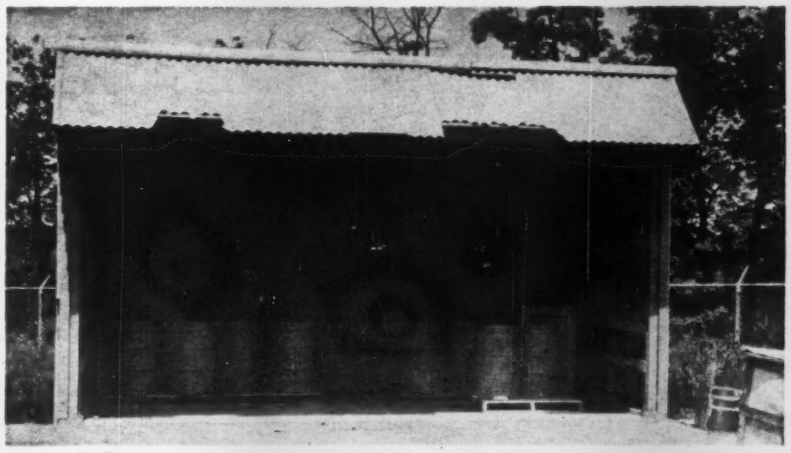
Depending upon the degree of danger, the wastes are classified as high, low or intermediate level. The average annual exposure allowed without management approval is five rems, no more than three of which may be absorbed in any consecutive 13 weeks.

High-level wastes, the source of radiation dose rates 10 to 100 times the normally recommended yearly dose, can be extremely dangerous and are shielded during collection and transfer as well as storage.

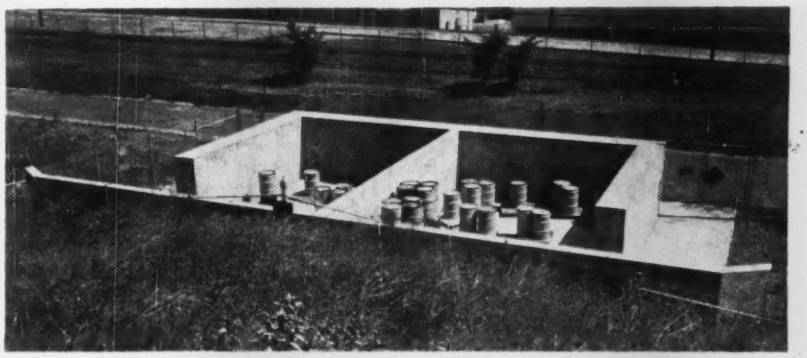
These wastes are packaged in aluminum tubing liners, handled with remote control equipment and transported in lead casks. They must be stored for a long time before they decay sufficiently to permit removal to an intermediate waste area or to a national "burial" site.

The high-level storage site at KAPL is underground so that the earth does most of the shielding. The enclosure is a reinforced concrete mass, 14 ft deep, built of a framework of light steel angles. Waste containers are stored vertically in 230 asbestos-cement tubes 4 in. in diameter and 20 tubes 8 in. in dia. A 4-ft-long steel plug filled with fine-grade concrete aggregate in the top of each space prevents upward radiation or "sky shine." For added protection, and specifically to prevent buildup of ice and snow in winter, a set of hatches cover the entire facility. An overhead portable gantry crane is used to position the cask containing the liner over an appropriate section. The liner is then transferred from the cask to a pipe section for storage.

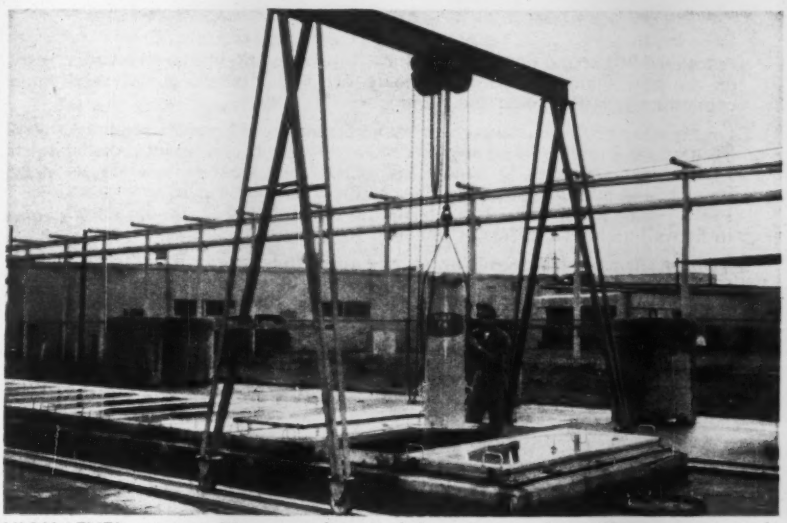
Intermediate-level wastes have a relatively high degree of radioactivity but also require storage for periods up to a year. Time limits are set on how long personnel may work in the area of these wastes. The structure that houses these wastes is built into a shale bank so that the ground does part of the shielding. The wall against the bank, designed as a full-fledged re-



LOW-LEVEL radioactive rubbish is shielded by an open shed. Normally this waste is stored for a short time until it has decayed sufficiently to be shipped.



INTERMEDIATE-LEVEL nuclear wastes need a thick concrete wall. They have a relatively high degree of radioactivity and are sometimes stored for a year.



HIGH-LEVEL "hot stuff" goes underground for greatest safety. These wastes can be extremely dangerous and are also shielded during collection and transfer.

taining wall, is 1 ft thick. The other three walls are 2 ft 8 in. thick. The floor slab is reinforced concrete, thick enough to permit a fork-lift truck to operate in the area.

Since a service road and a single track railroad line pass the storage area, thickness of the walls was governed by how often people pass, the length of time they are subject to exposure, and how close they can get to the source of radiation.

A 1 ft spacer wall divides the building in two so that plant personnel can store wastes in one compartment without being unnecessarily exposed to the wastes stored in the adjacent compartment. There is no roof on the intermediate storage area since the waste is stored in containers that will withstand the elements. The approach to the area is restricted by a cyclone fence.

Low-level wastes decay quickly. Although they emit radiation above the level to which we are exposed daily, personnel may work in the vicinity without exceeding the established limits of daily exposure. Normally, a short distance or air gap is all that is needed for adequate protection.

At KAPL, a steel-framed building with corrugated-asbestos sidings on three exterior walls is used to store the low-level wastes. For added protection, the facility is fenced off to isolate it from other work areas.

Highway Median Trench Traps Wandering Autos

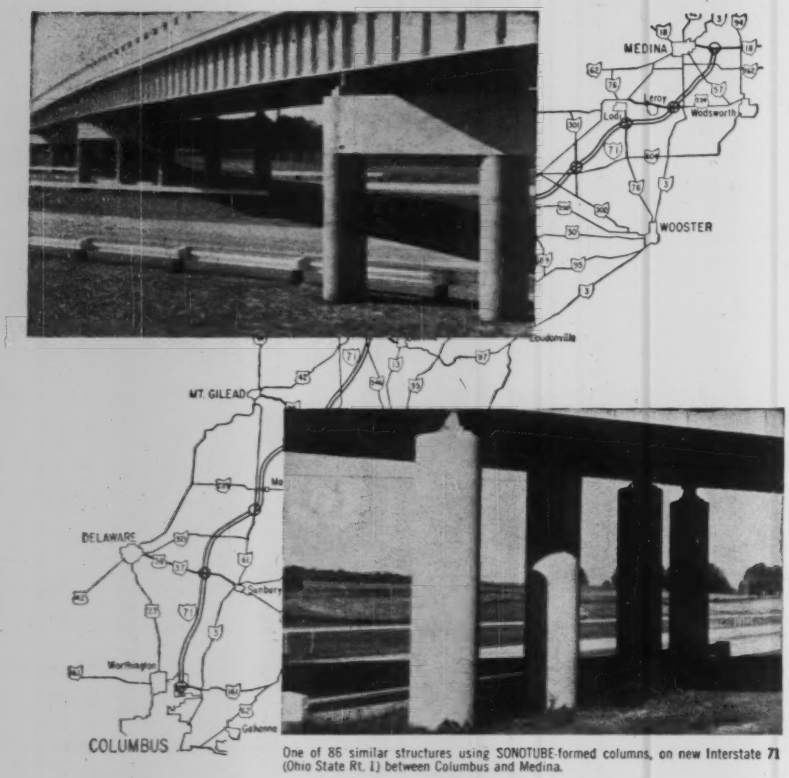
A highway median barrier that takes over the steering of runaway automobiles is under consideration by the Pennsylvania Turnpike Commission.

The median barrier is really a steel trench that traps the front left wheel of a car headed for opposing traffic lanes. The trench not only keeps the car from entering the opposing stream of traffic, it guides the car until it comes to a stop, says its inventor, Joseph Curtis, of Mechanicsburg, Pa.

The trench is 5½ in. deep and 10 in. wide. A sloping side, which extends 18 in. from the ground, turns the wheel of a car striking it at an angle and prevents the car from entering the opposing lane.

"Removing the cars from the trough is the least of my worries," says Mr. Curtis. He says this can be done by separations of the trench at intervals, or by the use of planks.

The median trenches, made of half-inch steel in 20-ft sections, would cost about $3 per foot, says the inventor, who has applied for a patent.



One of 86 similar structures using SONOTUBE-formed columns, on new Interstate 71 (Ohio State Rt. 1) between Columbus and Medina.

TIME-SAVERS on highway projects

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for round concrete columns

A total of 901 round concrete columns, supporting 86 bridge structures on the new Ohio Thruway (Interstate 71), were formed quickly and economically with SONOTUBE Fibre Forms.

On highway projects or wherever round concrete columns are required, SONOTUBE Fibre Forms help speed construction and reduce costs. Lightweight and easy to handle and place, they need only minimum bracing, and pour and strip quickly regardless of column size. SONOTUBE Fibre Forms are highly adaptable right on the job, too . . . can be sawed to fit wall and beam forms or punched for tie-in rods and anchor bolts.

To cut forming time and labor, and to reduce over-all costs, use SONOTUBE Fibre Forms for round columns of concrete—there is no faster, more economical method. Order sizes from 6" to 48" I.D., in standard 18' lengths or as required.

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Prefabricated Lighthouses Are Floated Into Place

Prefabricated lighthouses are being erected in Sweden. A newly developed "telescope method" makes it possible to construct the major part of a lighthouse on shore, including the fixing of permanent equipment in the structure.

It's done by building two closed-bottom caissons on shore, one nesting inside the other. The "caisson set" is then towed to the lighthouse site and bedded down. The inner caisson, the tower structure, is raised by pumping in water. It is fixed into position by anchoring it to the outer caisson, the foundation part of the structure. The telescopic parts can be adjusted both vertically and horizontally. The top part of the tower is built at the site.

Prefabrication avoids the scaffolding and concreting at sea that usually constitutes the riskiest and most expensive part of building lighthouses. Most of the work can be done regardless of weather conditions.

Robert Gellerstad, head of the Lighthouse Building Department of the Swedish Board of Shipping and Navigation, Stockholm, developed the building method.

Missilemen to Sight Stars From 90 Ft Under Ground

The airmen who will man the underground missile silos at Lincoln Air Force Base, Neb., will set the course of their Atlas ICBMs by the stars, but they'll have to do their celestial navigation from 90 ft below ground level where they will be safe from enemy missiles.

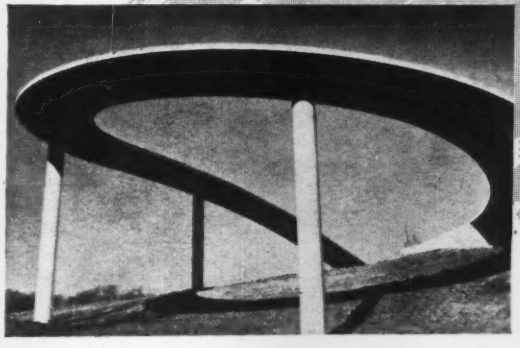
The Corps of Engineers specified an 18-in.-dia sight hole running from a point 90 ft down on the silo wall up at exactly 50 deg to ground level.

Instead of installing the piping for the sight hole by open cut, the builder, Western Contracting Corp., Sioux City, subbed the job out to the Construction Department of Armco Drainage & Metal Products, Inc., who jacked the pipe down.

A boring machine operating on an I-beam track is the driving force. When a 20-ft section of 18-in., ¼-in. wall pipe is placed on the guides, a 17-in. auger is inserted. Two hydraulic jacks push the machine forward while the auger carries material out of the hole.

After each 20-ft advance, the boring machine and auger is moved back and the next section of pipe and auger is placed on the guides. The new length of pipe is welded to the section in place and the process is repeated.

Pedestrian overpass, Des Moines Freeway, Des Moines, Iowa. Contractor: Cramer & Bayse Construction Company. Engineers: Howard, Needles, Tammen & Bergendoff, in conjunction with the Iowa State Highway Commission.



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Do it better . . . faster . . . for less. That's not just a motto, it's a *necessity* in today's construction industry. And for round concrete columns, SONOTUBE Fibre Forms are the time-saving, labor-saving, money-saving answer!

These one-piece, one-time-use forms eliminate many "normal" delays of concrete construction. There's no fabrication or assembly, no dismantling, cleaning, re-oiling or return-shipping. And, SONOTUBE Fibre Forms can be easily placed, braced, poured and stripped by semi-skilled labor.

There's a SONOTUBE Fibre Form to meet any job requirement and save contractors money in a dozen ways: "A" Coated—standard form for exposed columns; Seamless—for finished columns; "W" Coated—for unfinished or unexposed columns; Encasement Forms—for encasing existing members with concrete; and Special—for use in water or excessive dampness. Order sizes 6" to 48" I.D., standard 18' lengths or specified lengths.

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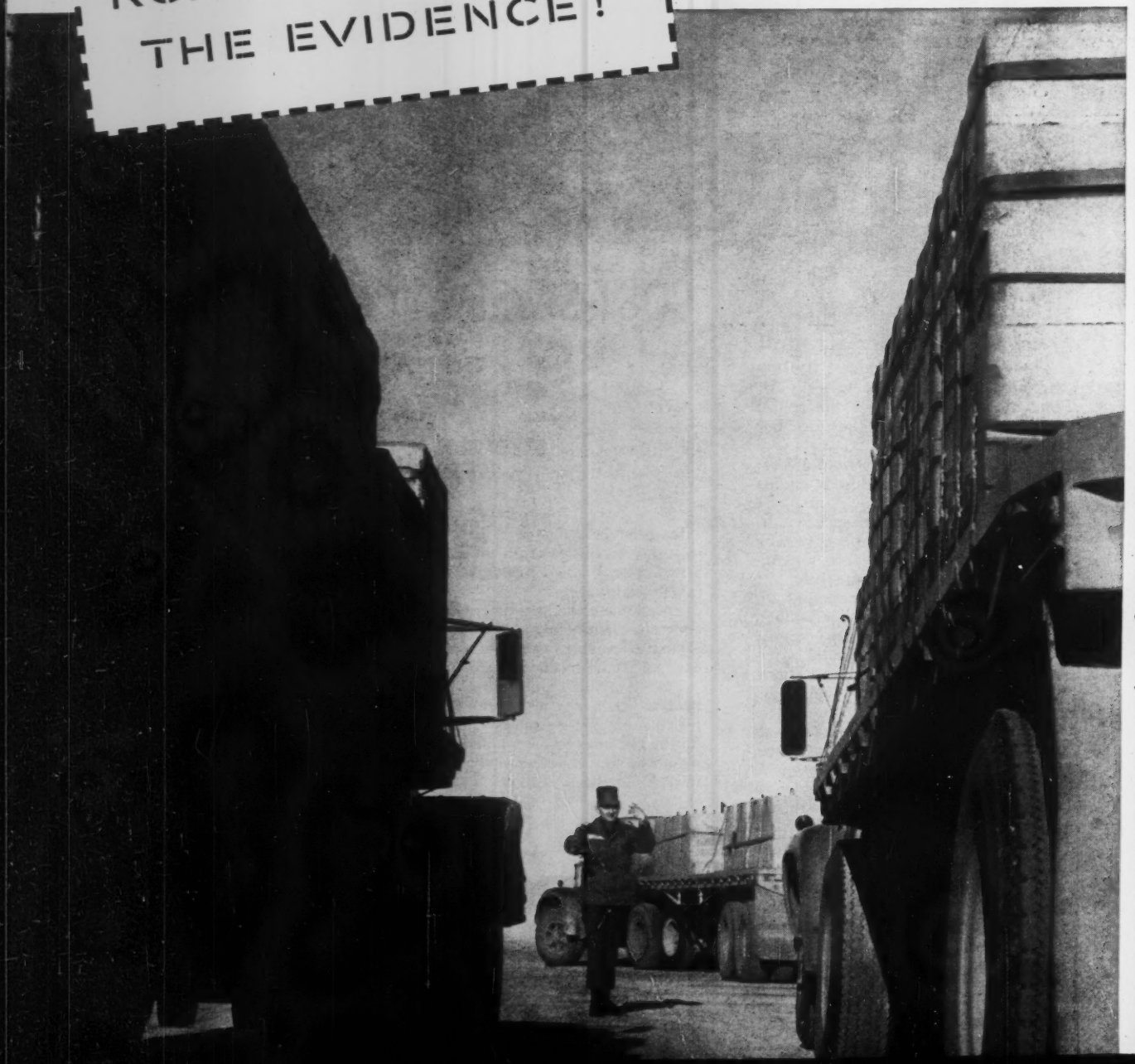
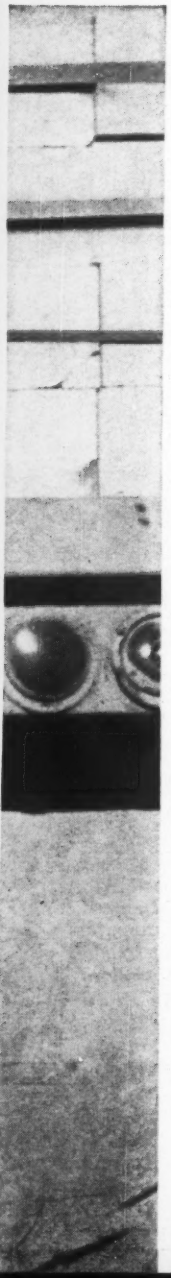


over asphalt basic ways...



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A count of pavement sections surviving in the great National Road Test, after two full years of traffic, showed concrete outlasted asphalt 3 to 1! Here is new confirmation that concrete gives more for tax dollars.

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. . . directed by the Highway Research Board of the National Academy of Sciences —National Research Council. Here is the most scientific pavement test ever made. Accurate instrumentation checked performance of test sections during 2 full years of traffic. 99 trucks, 19 hours daily, 6 days a week. There were 17 million miles of travel—1,113,762 load applications!

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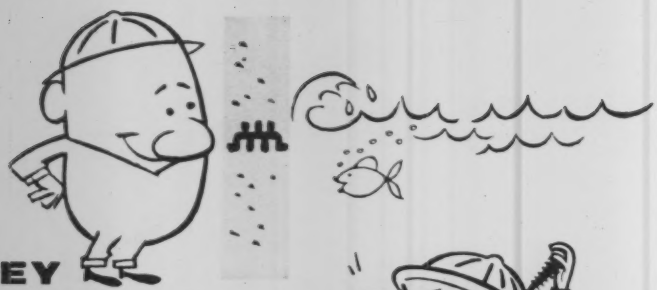
A national organization to improve and extend the uses of concrete



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SEAL

THEY
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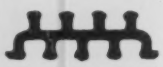
And Water Seals water stops have more miles of proved performance, too! This record, plus the ease of application and the broad variety of shapes and sizes of Water Seals water stops are all the proof you need of their desirability for your own concrete jobs. If you are after truly water-tight sealing between successive concrete pours, be sure to specify Water Seals water stops. They stand up under high temperatures and heads, even under extremes in shifting and stretching. They are unaffected by acids, alkalies, organic chemicals. Full engineering data and dimension drawings available immediately. Use the coupon.



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Water Stops. Unique, low cost installation! No form splitting required: just nail 'em in place! 2, 3 or 4 rib styles.

FLEXSTRIP
Water Stops. For horizontal or vertical construction joints, especially under extreme conditions of separation. Variety of widths.

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Water Stops. For expansion joints where shearing stress is anticipated. Three rib style most popularly used.

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Send engineering data and literature on Water Seals water stops.

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SEND TODAY

Reverse Lane Operation Reaches Record Length

The country's longest reverse-lane signal control section—four miles on the Lake Washington Bridge and its approaches—went into operation on U.S. Highway 10 east of Seattle recently.

During normal traffic conditions, the route is made up of four lanes, two in each direction. For peak-hour traffic, these become three lanes with a capacity of 3,500 vehicles per hour and a single lane that can handle 1,050 vehicles an hour.

Twice a day, when a reverse lane operation goes into effect, at 6:45 a.m. and 3:45 p.m., illuminated red Xs flash over the entrance of the lane assigned for reverse movement. This halts entry so that the lane can be drained of vehicles before an illuminated green arrow flashes at the other end, signaling that it is open for traffic. After the clearance period, three green arrows and a red X meet traffic at one end and one green arrow and three red Xs confront traffic at the other end.

The automatic lights replace a system in which rubber cones were distributed between opposing lanes of traffic.

Selo Electric Co. Inc., of Seattle, installed the system for the city of Seattle and the Washington State Highway Department at a cost of about $200,000.

Helicopter Sounds River Where a Boat Can't Go

The Portland District of the Corps of Engineers recently extended the helicopter's growing role in construction to taking river soundings.

The craft was rigged with a ⅛-in. cable weighted with a 50-lb counterbalanced lead plummet. The pilot handled the line with radio direction from shore.

Colored wooden markers on the cable indicated depths. Observations were made by transit from a jetty.

To protect the helicopter in case of snags, the plummet was connected to the cable by means of a leader designed to part at a 300-lb tug. An automatic cable cutter, which the pilot could operate by a kick of his foot, was installed in the helicopter as an added precaution.

The soundings will be used in predicting wave heights on a jetty near the area surveyed.

The Corps may use the same method again farther down the Oregon coast, at locations too close to jetties to permit boat surveys.

ON GUARD IN INDEPENDENCE SQUARE

About 75 feet away from Independence Hall, in the park to the south, stand R. D. Wood Hydrants like sentinels on duty. While their proximity to the Nation's most revered historic monument does not necessarily imply endorsement, we nevertheless like to think of them there, on guard night and day against the fire that could destroy what Gen. Howe saw fit to spare, and Clinton too, in the British occupation. But R. D. Wood Hydrants need no endorsement. For over a century they have shown themselves to be in constant readiness for any emergency. Of simple, ingenious design and rugged construction, R. D. Wood Hydrants are protected against ice and sediment—function smoothly when the engines arrive. There could be no better protection for any community than R. D. Wood Hydrants—and there could be no better protection for the birthplace of the U.S.A.

Conform to A.W.W.A. specifications

R. D. WOOD COMPANY

Established in 1803

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Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds)

New Joy TDM-B1 swing boom trac-drill has complete power positioning and automatic hose reel

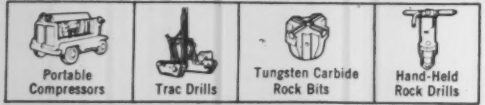
The new Joy TDM-B1 Trac-Drill with swing boom features full range power positioning of the drill. In swinging to any drilling angle from vertical to horizontal, there are no manual adjustments. The exclusive new hose reel trains air hose in all drilling positions, eliminating fouling—saving frayed hose and tempers.

Another exclusive feature, a new control arm swings the drilling controls with the boom. It puts the operator up front, where visibility for spotting is best, and then can be moved to any desired position—operation is independent of the boom.

The TDM-B1 carries Joy's dependable 450-DR Dual Rotation Drill. This drill provides hammer-free rotation for fast steel changes, plus a strong assist to normal rifle-bar rotation when needed.

The Joy TDM carrier is the most versatile machine in its class, and now offers you the option of either the new Swing Boom model, or the universal U-Bar machine. For complete information on the Joy TDM Trac-Drill, see your Joy distributor or write for Bulletin 2671-24.

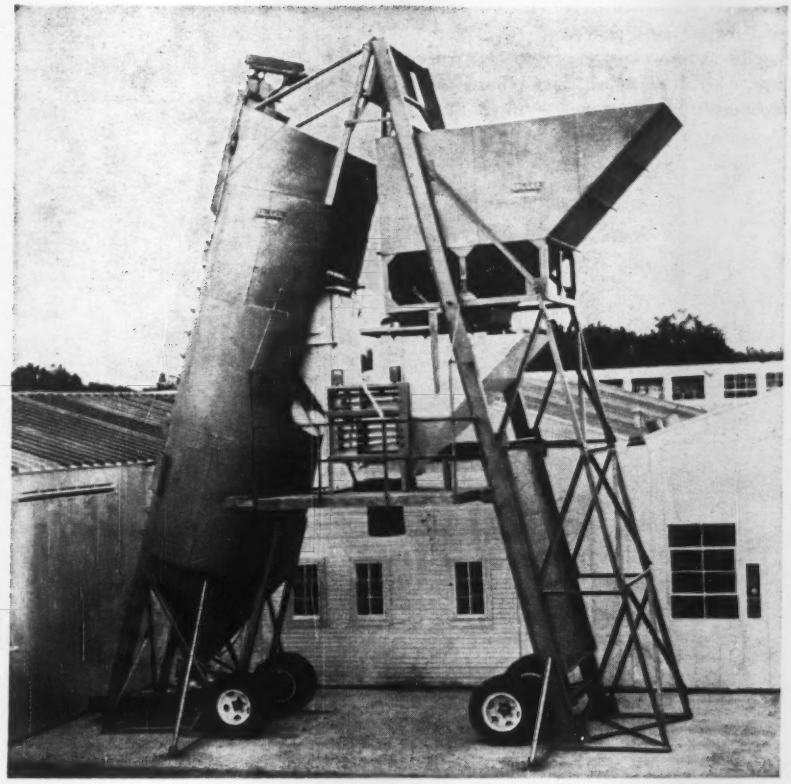
JOY CONSTRUCTION EQUIPMENT IS SOLD AND SERVICED BY THE JOY DISTRIBUTOR IN YOUR AREA



JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario



Batch Plant Tilts Up for Work

Production capacities of over 100 cu yd per hour are possible with the Con-E-Co Model B Portable Tilt-Up batch plant.

The Model B plant is designed for gravity material feed through separate weigh batchers to mixers or batch trucks. Both aggregate and cement units are built with dual wheel trailer ends and fifth wheel attachments at the front.

To assemble the plant, the units are pinned together at the front ends and hoisted into position with a crane. The batcher platform frame, bolted between the two halfs, acts as a rigid brace for the completed plant.

Each plant is available with either manual controls or a fully automated batching system.

All are prewired and include water piping and meters. Concrete Equipment Co., Inc., 1548 Front St., St. Blair, Neb.

Silver Ions Sterilize Liquids

A new device for sterilizing water and other liquids capitalizes on the bacteria-killing properties of ionized silver. The process is said to be suited to sterilizing swimming and wading pools because it eliminates the irritating effects of chlorine. Bactericidal effect is reportedly much greater than that of chlorine.

The units may also be used in breweries to kill fermenting agents, in bottling plants to stabilize soft drinks, and in hospitals to make germicidal ice.

In the sterilizer, water passes over six electrically charged silver rods and acquires ions from progressive electrolytic decomposition of the rods. This produces a concentrated germicidal solution, which is then introduced into the main body of water.

The bacteria-killing potential is governed by the silver ion concentration, which in turn depends on the amount of electricity fed to the silver rods.

The sterilizers come in three sizes rated according to cumulative treatment capacity—7.9 million gallons, priced at $972; 50.8 million gallons, $1,222; and 144 million gallons, about $3,500. Cost of replacing the silver rods after they have treated their rated gallonage is $220 for the small size, $314 for the medium and $1,325 for the large.

The maker is also working on a battery-operated portable unit that can be used by campers to purify drinking water. Dynion Water Systems, Inc., Omaha, Neb.

Bridge Bottom Insulation Prevents Sudden Skidding

Sudden skids, experienced by motorists crossing a bridge that has iced up before the adjacent road surfaces have frozen, can be eliminated with Barrett Urethane Insulation, according to the manufacturer.

The insulation consists of a 1-in. thick layer of urethane foam sprayed on the underside of the bridge deck. It is said to lower the bridge's rate of heat loss to equal that of a roadway with 2 to 5 ft of earth beneath it.

Tests conducted on two bridges this past winter showed that the insulation reduces the number and rapidity of freeze-thaw cycles, which can cause cracking and spalling in concrete. Another cause of spalling, repeated heavy applications of deicing salt, is proportionally reduced.

Since the foam is light—an area 1 ft square and 1 in. thick weighs only three ounces—it presents no structural problem. With a special gun that mixes two liquid components in its nozzle, a technician can spray the foam directly on to steel or concrete. The surface needs no special surface preparation. Barrett Div., Allied Chemical Corp., New York, N. Y.

Roller Tamps and Levels Slabs in One Operation

The "Rollerbug," a tandem roller consisting of two 5-ft perforated steel rollers with a 12-ft magnesium handle, combines tamping and leveling a concrete slab into one operation.

The rollers push large aggregate into the plastic mix about ½ to ⅛ in. below the surface of a slab that has just been screeded. This leaves the correct amount of cement paste at the surface for smooth, easy finishing, according to the manufacturer.

Extension handles can put an area 36 ft in diameter within reach of the workman operating from one spot.

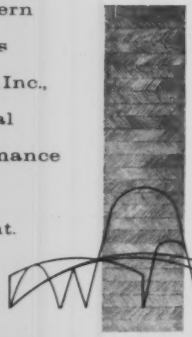
Except for the steel roller surface, the Rollerbug is made of magnesium and aluminum and bronze bearings. This keeps it lightweight and easy to handle. Goldblatt Tool Co., 1910 Walnut St., Kansas City 8, Mo.

O'Hare-Chicago Motor Hotel, Chicago, Illinois. Architects: Arthur Swanson & Associates, Skokie, Ill. Contractor: H. Andrews & Sons, Inc., Chicago, Ill.

Space provided: main lobby, gift shop, vestibule, registration desk and office, carport. *Structural framing:* glulam beams spaced at 6'-8", resting upon glulam columns. Butterfly beam-and-column bents placed in pairs and spaced at 16'-5" and 21'. *Exterior walls:* weathered lannon stone with light weight concrete backup. *Interior walls:* stone and vertical wood paneling. *Floors:* carpeting over reinforced concrete slab; terrazzo in vestibule. *Roof:* 4-ply built-up surface over 3" insulating board. *Lighting:* incandescent and fluorescent. *Heating and ventilating:* combination heating and cooling of gas absorption type, using central type installation with individual thermostatic controls for each room. *Area:* framed by glulam timbers, 7,675 square feet including carport.

Sweet's

Architects who seek to avoid the ordinary get a powerful assist from the natural warmth, texture and pattern of glued laminated timbers. As manufactured by Timber Structures, Inc., these quality controlled structural members provide dependable performance and handsome appearance that richly reward the architect's judgment.



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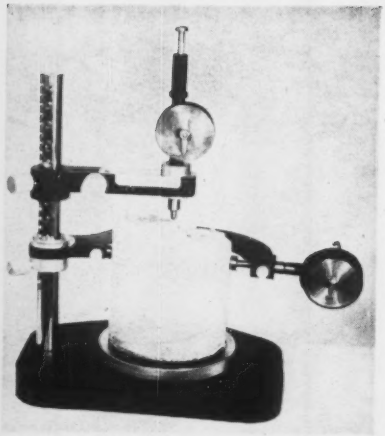
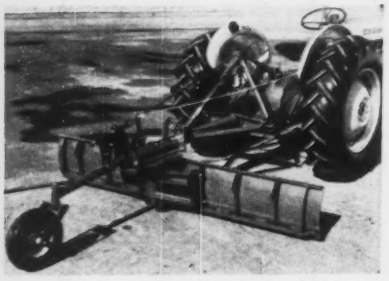


Laboratory Tool Measures Concrete Core Samples

Length and diameter of drilled concrete test cores can be found simply with a new measuring tool.

The unit accommodates 4-in. and 6-in. cores. A core under test rests on end on a revolving table that locks into eight positions about its axis for making the several height measurements required by ASTM specifications. The table also shifts laterally between two positions corresponding to 4-in. and 6-in. core diameters. SOILTEST INC., 4711 W. NORTH AVE., CHICAGO 39, ILL.



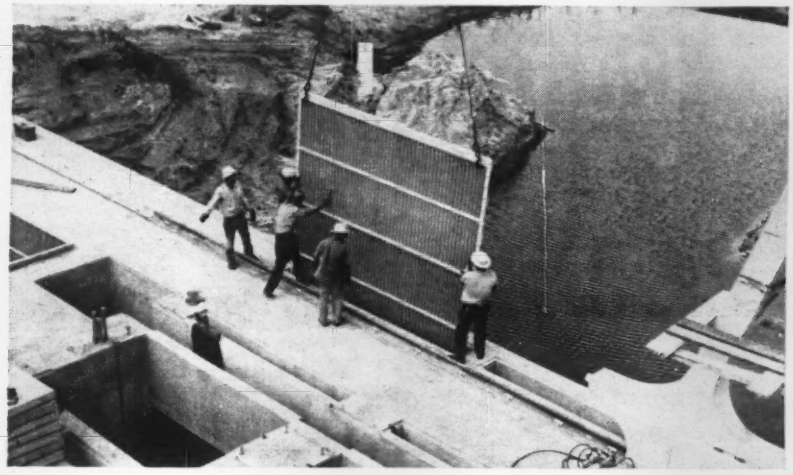
Earthmoving Implement For Rear of Tractors

An adjustable blade that can be attached to the rear of a tractor handles road grading and light earthmoving operations.

The implement's frame members are built of steel tubing. The blade is reinforced throughout its length by an extra member of shaped steel plate. The implement can be attached to any tractor with Category I or II three-point linkage system. Blade lengths of 6 and 8 ft are available. TRACTOR AND IMPLEMENT DIV. FORD MOTOR CO., BIRMINGHAM, MICH.

BYERS GUIDE

Tips on Reducing Corrosion Costs from A. M. Byers Company VOL. 2, NO. 5



Rectangular Trash Rack is lowered into position at the Indiana Head power plant, at Orlando, Florida

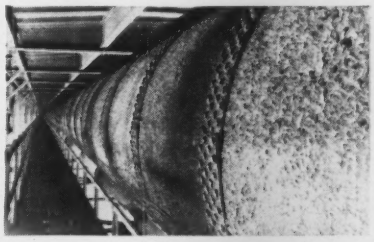
How to Use Wrought Iron to Combat Corrosion, Abrasion and Fatigue Damage

The trash rack shown above offers another example of the rugged versatility of 4-D Wrought Iron. Here, the ability of Wrought Iron to keep maintenance costs at a minimum shows up in a number of ways. Installed at the Indiana Head power plant of the Orlando, Florida Utilities Commission, the rack will keep river debris from getting into diversion tunnels. Fabricated from 4″ x 4″ x ⅜″ angles and 4″ x ⅜″ bars, the two racks were set in vertically. 4-D Wrought Iron was specified since it not only resists aggressive waters, but is not affected by wet-dry corrosive attack.

Another use which demonstrates Wrought Iron's ability to take wet-dry corrosion, with the added hazard of salt water exposure, are the "pants" put on steel H-beam piers of the Rye-New Castle, N.H., bridge. To extend their service life, the piers are jacketed with ½″ thick Wrought Iron. The jackets are 24 inches in diameter and are positioned to cover the H-beams between high and low tide marks. Wrought Iron has the ability to form a dense, tight coating which protects the underlying metal. In effect, Wrought Iron puts corrosion to work—to fight further attack.

In a similar application, Wrought Iron plate is protecting concrete bridge piers on a new span across the Ohio River near Pittsburgh, Pa. Here, ½″ Wrought Iron plate guards the 9′ x 49′ piers from erosion or spalling of the concrete and damage from ice floes and other debris. In addition, Wrought Iron pipe was used for the bridge drainage system.

When designing for permanence and for minimum maintenance, specify Wrought Iron. An eight year corrosion test study report is yours for the asking. Use the coupon.



Big wrought iron line carries water to Manhattan

One Hundred Years Old—and Still Going Strong

The Croton aqueduct carries water to New York across the Harlem River Valley. Laid on a viaduct known as High Bridge, the aqueduct is made of ½″ Wrought Iron plate fabricated into a 7½′ diameter pipe.

Installed in 1861, the aqueduct had rendered faithful service for more than a half-century when, in 1925, rebuilding of High Bridge gave occasion for a thorough inspection of the pipe. Engineers reported that the interior walls had formed the dense, protective layer of rust that is characteristic of Wrought Iron, and found there was no deep pitting. It was determined that the pipe was good for at least 20 more years of useful life. In 1951, another thorough engineering inspection revealed that the Wrought Iron line was still in excellent condition. Today, after 100 years of uninterrupted service it is still "going strong."

This performance record is certainly startling, but not at all unusual. Time after time, Wrought Iron has established its ability to resist corrosion for long periods. Where this kind of endurance is a must—specify Wrought Iron. Details on request—use the coupon.

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PIPE PRODUCTS: Wrought Iron • PVC • Steel
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Please send data on items checked:
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Company _____
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City _____ Zone _____ State _____

Firm on the 120-TON FRANKI BASE

This is Gateway Center Building No. 4 in Pittsburgh's Golden Triangle. It is supported by 647 Franki Pressure Injected Footings similar to the photo at the right. The unusually high carrying capacity of 120 Tons each is secured in forging the base, when the density of the subsoil is permanently multiplied by

COMPACTION UNDER BLOWS OF 140,000 FOOT POUNDS

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PUMPS AND RAMS (Center hole or solid) 10 TO 300 TONS CAPACITY

Pre-stress concrete; pull gears, sleeves, wheels, etc.; lift, push and pull heavy loads.

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For tunnel, sewer or conduit . . . all types of steel forms designed and built to exacting requirements . . . world-wide. Send for Bulletin No. 22 today.

MAYO

TUNNEL AND MINE EQUIPMENT

Lancaster, Penna.

Wall Panels Secured By Inflating Air Seals

Inflating air seals at the top and bottom of Airwall panels secures the partitions in place. No special floor or ceiling attachments are required for the portable wall; all that's needed is a ceiling for the top of the panel to butt against. The 36-in.-wide panels are custom cut by the manufacturer to fit specific ceiling heights.

To inflate the seals, you fit a hand pump into an air valve at the side of the panel and pump until the panel fits tightly. Corner and end panels have the air valve near the top. Tongue-and-groove edges align the panels into smooth, flush wall surfaces.

The 2⅛-in.-thick panels have a sound attenuation equal to a 2x4 stud and plaster wall. Panel tops are provided with a felt lining to prevent marring of ceilings.

Price of an unfinished panel is $6.00 per sq ft. Finished panels run to $11.00 per sq ft depending upon finish. Richards-Wilcox Mfg. Co., Aurora, Ill.

In-Line Centrifugal Fan Is Smaller and Quieter

A centrifugal fan with a straight-line air flow occupies less than half the floor space of a conventional fan. The unit, called Centriline, can be used for ventilation, air conditioning and other handling application, according to the manufacturer.

The fan is easily installed in former "waste space" areas. It can be hung from the ceiling, mounted on the wall or stacked, one fan on top of another.

Centriline has an airfoil bladed centrifugal wheel and multiple aerodynamic

(*New Products continued p. 108*)

"...nothing like a UNIT for low upkeep"

—H&W CONSTRUCTION CO.
MORTON, WASHINGTON

Specializing in road building, the H&W Construction Co. uses a 5/8-yd. Model 617 shovel to load all its road surfacing material. The UNIT feeds the company's crusher, handling approximately 450 yards of material per day, and, in addition, loads out all trucks. The owners have this to say: "There's nothing like a UNIT for LOW UPKEEP. We've run ours four years with less than $100 repairs expense, and have run it steady, too."

Low upkeep naturally results from UNIT advanced design. For one thing, UNIT gives you the industry's *only* one-piece main machinery gear case. All gears, shafts, and bearings are completely enclosed in a constant oil bath. Flawlessly sealed at every point, this case keeps lubricants in — dirt and abrasives out!

Advanced design carries over to component parts, too. *All* spur and bevel gears, worm drives, and rollers are forged for uniform toughness. Shafts are involute splined for greatest strength. Gears, shafts, and many other essential working parts are scientifically heat-treated; wear surfaces are flame-hardened for longer life.

Why not take time out to talk to the owner and operator of a UNIT in your area. See how often LOW UPKEEP and HIGH PRODUCTION pop up during the course of your conversation. Then, get in touch with your local UNIT distributor ... let him give you all the facts!

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SHOVELS: ½ Yd. to 1 Yd. • CRANES: 5½ Ton to 21 Ton • DRAGLINES ½ Yd. to 1 Yd. • TRENCHOES: ½ Yd. to 1 Yd. • TRUCK CRANES: 10 Ton to 40 Ton

IN NEWTON, MASS., 55,000 square feet of Steeltex were installed in floors of South Newton High School. Architect: Korslund, LeNormand & Quann, Inc., Norwood, Mass. Structural Engineer: B. C. Hryniewicz, R. E., of Symmes, Maini & Hryniewicz, Cambridge, Mass. Contractor: M. S. Kelliher Co., Boston.

IN PITTSBURGH, PA., 350,000 square feet of Steeltex were installed in floors of the North View Heights Housing Community. Architect: Mitchell, Ritchey, Douden & Simonds, Pittsburgh. Structural Engineer: Leland W. Cook, RPE, Pittsburgh. Contractor: Youngdahl-Crump-Psaty, Pittsburgh.

IN CLEVELAND, at National Cash Register Building, Steeltex is quickly unrolled by one man. Architect: Irving D. Robinson, Cleveland. Contractor: D. W. Rankin, Inc., Cleveland.

IN FOX CHAPEL near Pittsburgh, Steeltex is tightened over joists. At Fox Chapel Area High School 125,000 square feet of Steeltex were used on floors. Architect: Hunter, Campbell & Rea, Altoona, Pa. Contractor: Youngdahl-Crump-Psaty, Pittsburgh.

'Wish We Could Use Steeltex On Every Job,' Says Contractor For $3-¼ Million School

"We're always happy when Steeltex is specified—wish we could use it on every job," said Joe Remaley, pointing to a 125-foot length of the paper-backed, wire mesh reinforcing stretched over steel joists.

"Just unroll it, cut to the length you want, tighten, clip to the joists, pour your concrete and forget about it. It's that simple.

"On top of that," he added, "you know you'll get a good slab reinforced where you want it with good galvanized mesh."

Mr. Remaley referred to use of Steeltex in Fox Chapel Area High School near Pittsburgh. Here 125,000 square feet of Steeltex provided form and reinforcing for floors.

Steeltex' ease of installation was emphasized by John Carey, foreman of the three-man J. C. Jackanic, Inc., installation crew.

Only two men in the crew had used Steeltex before. "But we found Steeltex very easy to install," Mr. Carey explained, "simply by referring to the instruction folder that comes with each box of clips."

● **Steeltex For High School** — In Newton, Mass., during construction of the $3 million South Newton High School, 55,000 square feet of Steeltex were installed in the floors.

Structural Engineer B. Chester Hryniewicz declared: "In preparing detailed cost analyses for different types of floor construction, I have found Steeltex with bar joists costs 35 percent less than conventional concrete slab and steel beam construction."

Leonard W. Quann, AIA principal in charge, added: "Here we had a tight construction schedule and weight was a factor, too, because most of the buildings were constructed on piles. As a result, Steeltex was chosen without question."

The architectural firm of Korslund, LeNormand & Quann was awarded a citation for this school by the American Association of School Administrators.

● **Steeltex For Housing Project** —Steeltex was commended also during construction of the $17 million North View Heights Housing Community for the Pittsburgh Housing Authority. More than 350,000 square feet of Steeltex are used in low-rent family units.

Joseph Slutsky, AIA, resident architect for Mitchell, Ritchey, Douden & Simonds, said: "You get good solid construction with Steeltex. The paper provides all the form you need while the mesh gives the proper reinforcing."

● **Steeltex For Office Building**— In Cleveland, Ohio, 32,000 square feet of Steeltex in the floors of the new National Cash Register Building drew this comment from Charles Nemec, the contractor's general superintendent:

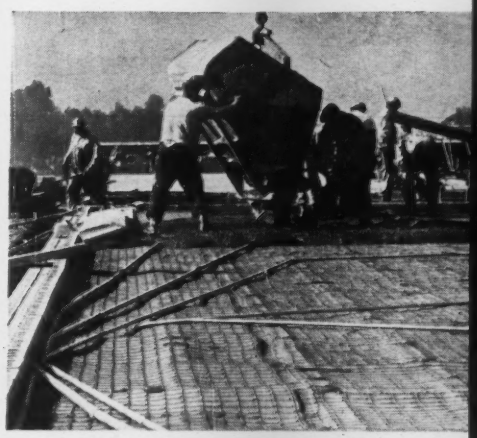
"When properly installed, Steeltex can save up to 15 percent on concrete because it can be tightened over joists."

Architect Irving D. Robinson said he likes Steeltex because, in addition to reinforcing, it holds moisture, providing proper cure for concrete. "There's no concrete dripping through" he said.

● **Steeltex For College**—"Two men can form with Steeltex faster than six men can form with other materials," said W. D. Foulke, superintendent for Henry Shenk Co. during construction of the $1.5 million addition to Villa Maria College in Erie, Pa. Architect for the job: Nelson, Goldberg & Heidt of Erie.

More than 50,000 square feet of Steeltex were used in the floors. "Steeltex provides a substantial working surface, too," Mr. Foulke continued. "It speeds up concrete pouring and presents no problems in fitting around projections such as pipes and vents."

Whether your next construction job calls for a hotel, school or office building, you too can cash in—as these architects and contractors have. Contact the nearest Pittsburgh Steel Products Division sales office listed below for engineering help on your next job.



CONCRETE IS POURED just minutes after Steeltex is installed, providing uninterrupted construction schedule. Electrical conduit has been wire-laced to Steeltex' galvanized wire mesh.

▶ See Sweets Catalog Section 2g

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conversion vanes—a combination that makes for quietness of operation. It also has equal inlet and outlet duct connections, which allows easy installation, says the manufacturer.

The fan is available in six sizes, with airfoil wheels ranging from 27 in. to 44½ in. in diameter. Its volume ranges from 4,600 to 48,000 cfm. Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Boston 36, Mass.

Blaw-Knox Introduces 4- to 10-Cu-Yd Mixers

A line of transit mixers introduced by Blaw-Knox is available in 4- to 10-cu-yd sizes with flywheel power take-off, front engine power take-off or separate engine power trains.

Dubbed "BuKaneer," the line uses a heavy-duty transmission that provides four forward and four reverse drum speeds. Mixer controls, located both front and rear of the drum, are air-electric.

Charging speeds for the units range from 10 to 22 rpm and discharge speeds range from 2 to 22 rpm.

Standard water tank is of steel and has a 150 gal capacity, but other tank sizes are available in either steel or aluminum.

All water tanks are equipped with sight glasses and measuring gages.

Other available accessories include pressurized flush systems, aluminum chutes and witner recirculatory water systems. Blaw-Knox Co. 411 Seventh Ave., Pittsburgh 19, Pa.

Powder Powered Fastener Reduces Stud Ricochet

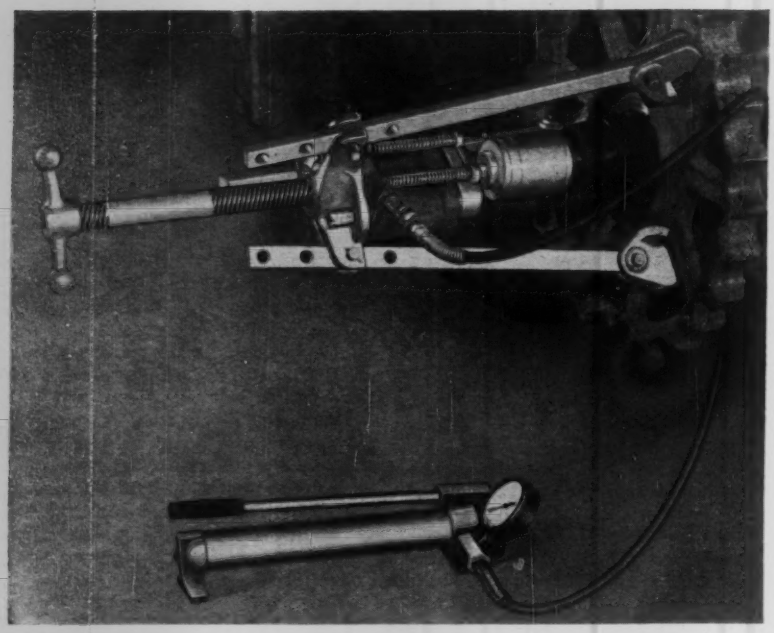
The DX 500, heavy-duty fastening tool that can drive studs up to ⅜ in.-16 into concrete, masonry and structural steel, has been added to the Hilti line.

The new tool is designed to eliminate the hazards of ricochet, fish-hooking and explosive spall, according to the manufacturer. It will fire only when the stud is in contact with the material to be penetrated.

Like Hilti's smaller DX 100L model, the DX 500 starts the stud in contact with the material and then pushes it in.

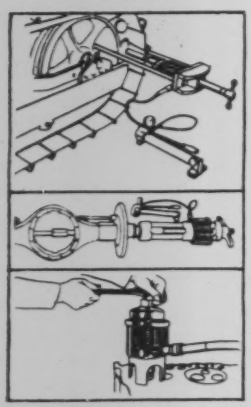
A blank cartridge in contact with the driving piston is fired by striking the head of the tool with a heavy hammer.

A complete line of studs and pins is available with the tools. All the fasteners are produced with installed washers, which prevents over-penetration. Hilti, Inc., Stamford, Conn.



One man pulls sprocket in minutes... on-the-job...with OTC puller-installer

One man, in minutes can pull or install a tractor sprocket on-the-job with an OTC hydraulic puller-installer set. Saves hours, even days, of costly down-time. Special pullers with up to 100 tons of hydraulic power are designed in co-operation with major tractor manufacturers to do all types of maintenance jobs—fast—without damage to parts. One basic hydraulic unit with special attachments will handle a variety of tractors.



VERSATILE RAM AND PUMP AVAILABLE FOR MANY OTHER JOBS

Track Master Pin being removed with same Power-Twin ram and pump plus accessories. Pin is removed—installed in minutes. Hand, electric or gas driven pumps available.

Truck Axle Tube being removed with OTC Hydraulic unit and accessories. Same unit installs tube — fast — without distortion.

Valve Seat Insert being pulled with 17½-ton Power-Twin ram and pump. Takes little effort and does not damage cylinder head. Three sizes fit most engines.

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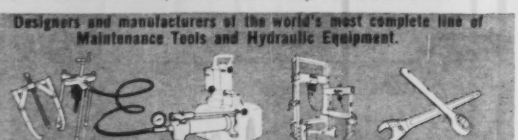
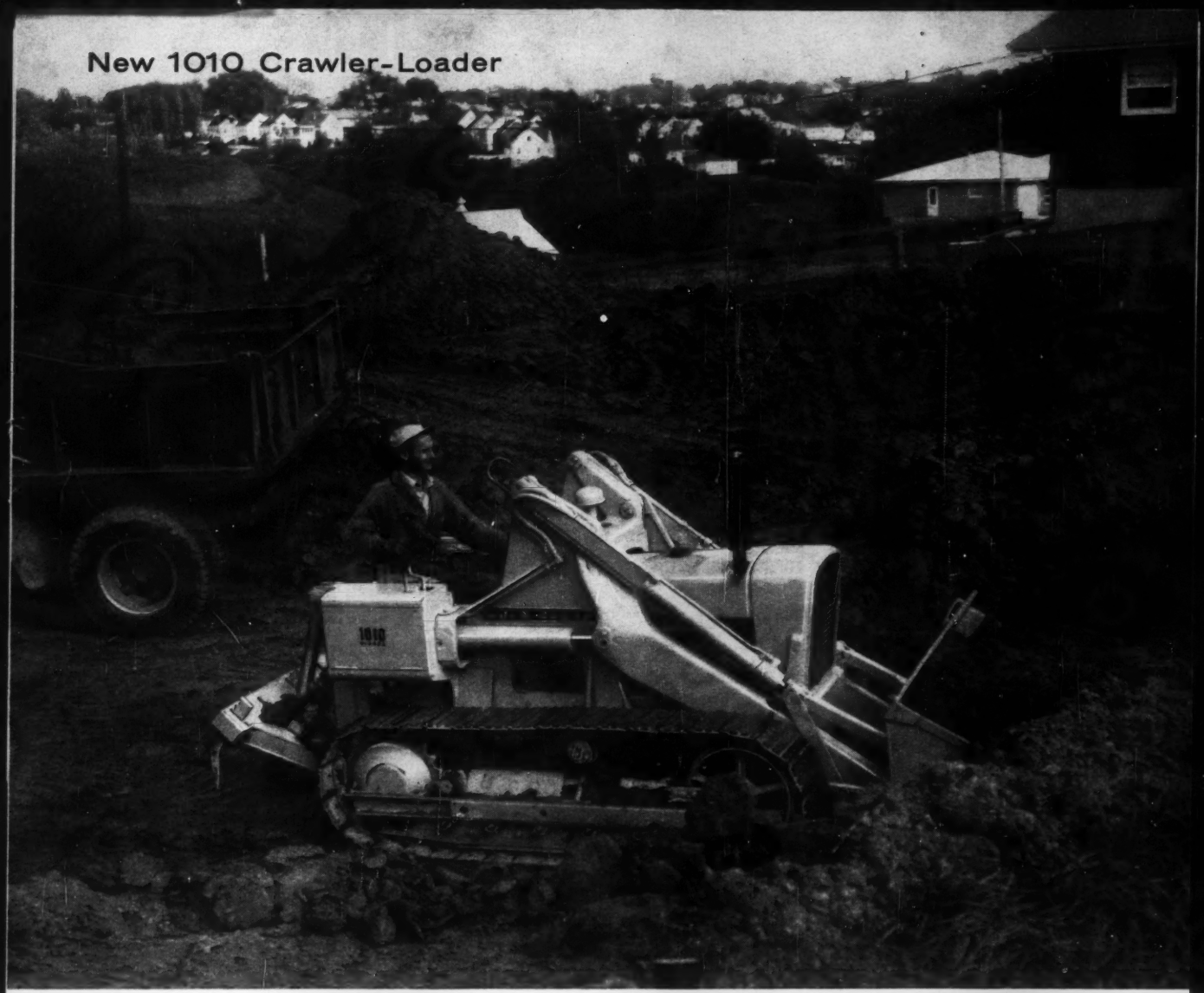


PULLERS AND PULLER SETS · HYDRAULIC RAMS AND PUMPS · HYDRAULIC SHOP PRESSES · HAND TOOLS



Now he'll back up without shifting or clutching

The direction reverser does it. A left-hand dash lever controls the hydraulically operated unit, and two big-capacity wet clutches smooth the switch from forward to reverse. Same clutch makes it easy to slip into other gears, too. And with this optional equipment, there's a reverse to match every forward speed.

Look for the same ease of control in bucket operation. A single lever commands cylinders for lift arms and bucket —further helps to boost daily yardage.

Engineered throughout for efficient use of its forty engine horsepower, the new John Deere "1010" Crawler-Loader is available in gasoline or Diesel, and is furnished with scarifier or rear mounting for the John Deere 50 or 51 Backhoe. Bulldozers and Bulldozer-Sideboom units are also available.

For information, consult your dealer through the classified telephone directory or write John Deere, 3300 River Drive, Moline, Illinois.

JOHN DEERE BULLDOZERS LOADERS BACKHOES AND EARTHMOVING EQUIPMENT

JOHN DEERE

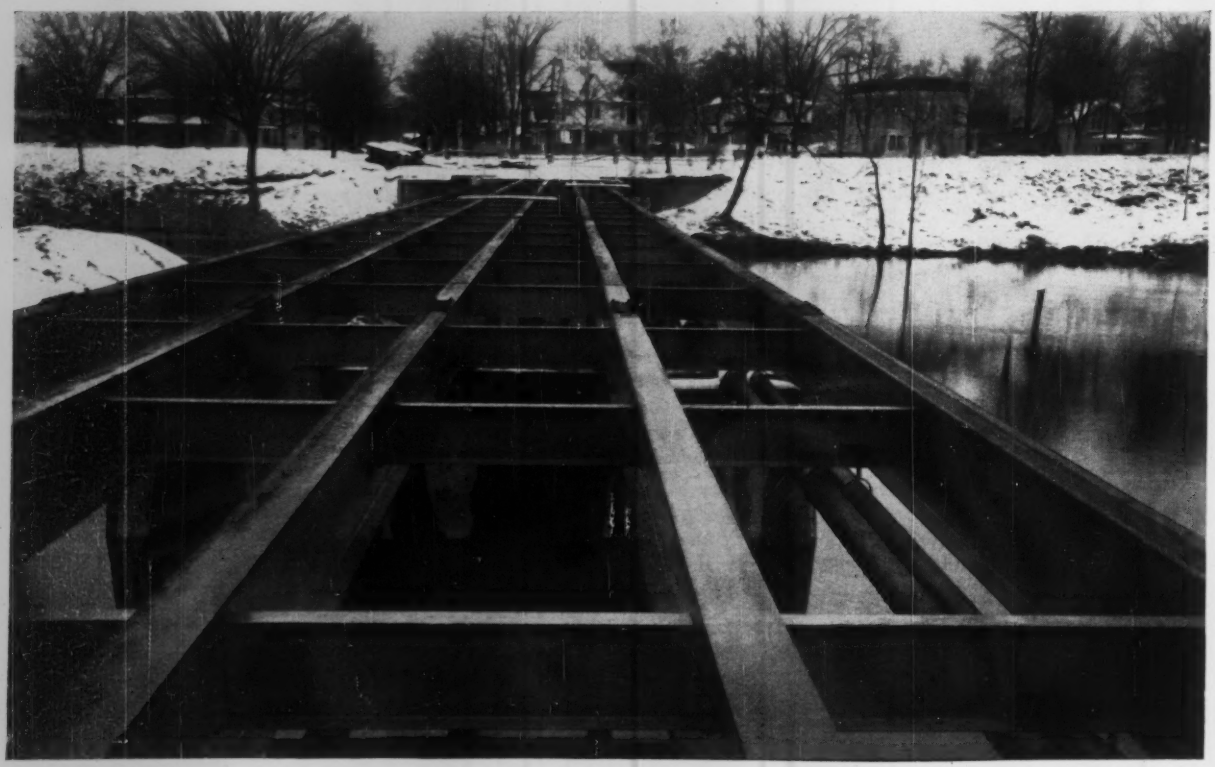
no wonder the contract went to steel—steel cut costs by $23,000!

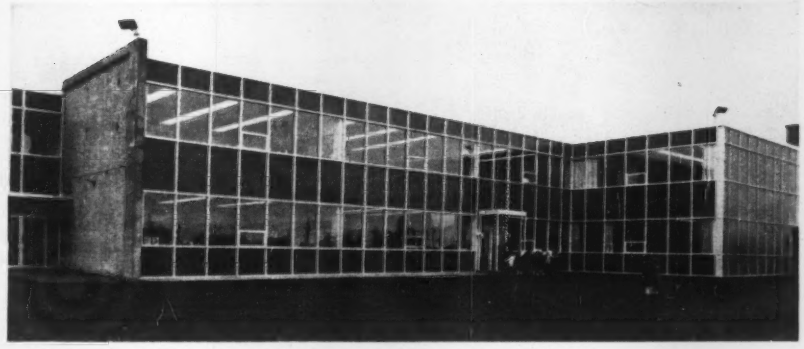
They were almost ready to go ahead on the new bridge in Elkhart County, Indiana, when they decided to take a second look at costs. Original plans called for material other than steel, but maybe steel construction could save money.

And save, it did! Steel bids were actually $23,000 lower and that wasn't all. Maintenance had not been one of the considerations till the steel bid suggested its importance—as one consulting engineer put it, "I've never seen or heard of any type bridge which is maintenance-free." Thus, even with maintenance included, steel construction was shown to be less costly than any other material. In fact, accompanying studies clearly showed the only maintenance required would be painting and that only $4,488.84 invested at 3% would take care of that for 50 years. Thoroughly convinced, the County Commissioners changed the plans and awarded the contract to steel.

Use Steel for Modern Construction

This is another example of the efficiency, lower initial cost and minimal maintenance required when construction plans call for STEEL!





Insulated wall mullions match existing lines.

Mullion Design Beats Heat Transfer

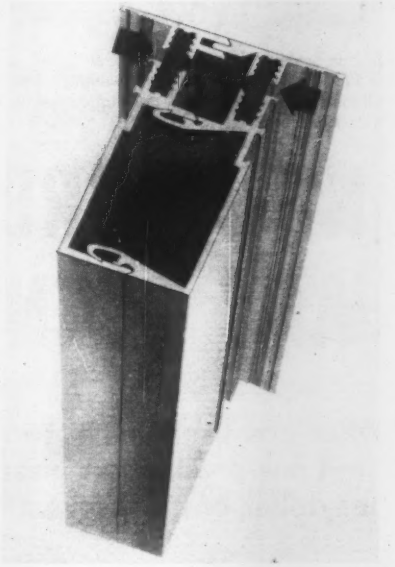
A complete thermal barrier separates exterior and interior metal components of the Insu-Wall line of Marmet curtain wall elements. As curtain wall applications have spread throughout the building industry, heating and cooling requirements have increased to offset the problems of heat gain and loss through these building skins.

Marmet engineers say they have a practical answer to the curtain wall heat gain-loss problem. They report their 8442 Series Insu-Wall boasts a U factor of thermal transfer totaling only 0.408. They compare this to the U factor of 0.58 for a one inch thick double insulated window to make their point.

Their design consists of separate aluminum extrusions tied together from front to back with plastic strips or bars. The material is similar to Formica but compounded to expand and contract at the same rate as the aluminum frame members. Though the inner and outer frame components are completely separated by the tough plastic, there is a high mechanical bond from front to back of the complete section. The strips fit tightly into serrated slots in each component and are held there by an epoxy resin. In addition, heavy pins cut through the aluminum slot walls and the plastic separator to provide high shearing strength for the complete wall component.

The standard mullion section is assembled from split halves with a mortise and tenon type of joint. Vinyl plastic weather strip held in channels at each joint form a seal against the entry of water.

The curtain wall has been erected in a Fairbanks, Alaska, school and in laboratory test chambers for conduction tests. Marmet says that at a 105 deg differential—74F inside and —31F outside with a relative humidity of 35%—frost would form on insulated glass in the test chamber before building up on the interior metal of the curtain wall.



INSULATING plastic bars between front and back block heat gain or loss.

The Insu-Wall sections are well adapted to high humidity areas such as swimming pools, where condensation on inside wall surfaces can be a problem.

The new line of wall components matches existing lines of Marmet curtain walls for complete adaptability with existing design standards. Where temperature extremes are not a problem, Insu-Wall can be applied to specific problem areas of a building and matched with regular components. Completely self-contained, the Insu-Wall sections climinate double assembly work necessary with previous insulated wall designs, the producers say. MARMET CORP., BELLIS ST., WAUSAU, WIS.

STEEL CONSTRUCTION IS SIMPLER IN DESIGN

because steel leads naturally to designs which express the function of the structure, no matter how simple or complex.

LESS EXPENSIVE

because it can be used to support loads economically on spans of any desired length, and because the lightness of steel in proportion to its strength makes it the least costly to transport and to handle on the job site.

STRONGER AND LIGHTER

because dead load stresses are minimized. Steel decking may take the form of flat steel plates, corrugated steel planks or gridwork either open or filled.

MODERN

because steel can be fabricated into forms of the utmost lightness and grace as well as into massive and majestic structures. What's more, steel can be coated with color in infinite variety to blend or contrast with the surrounding landscape—thus form and color are combined by the designer to attain modern beauty and perfection.

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INLAND STEEL COMPANY

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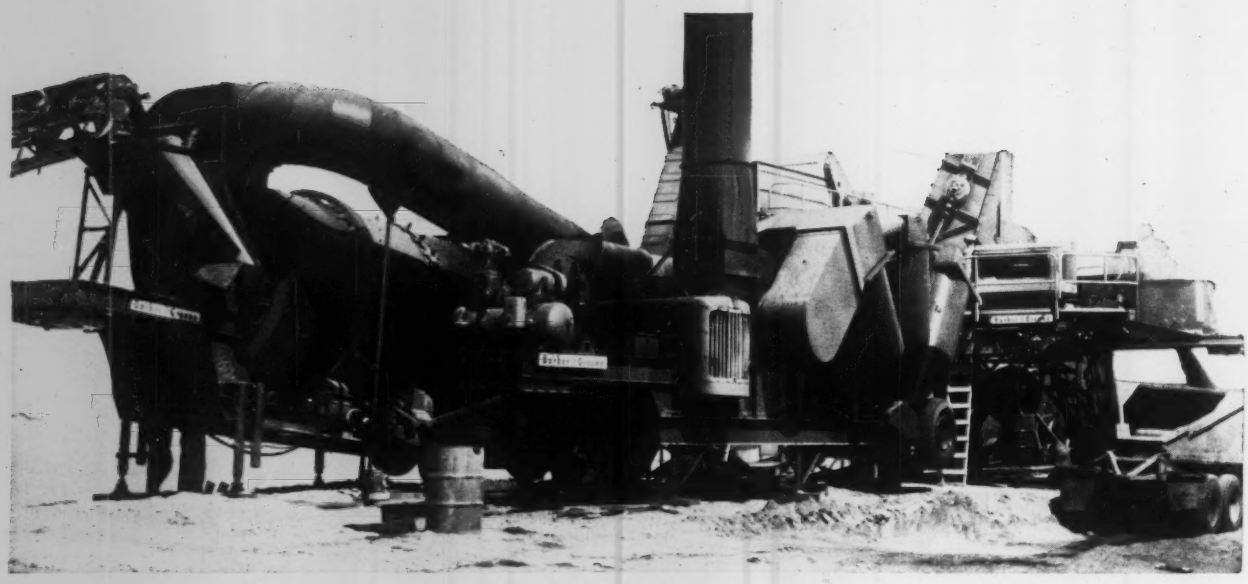
Wide Flange Beams • Steel Plates • Bearing Piles and Steel Sheet Piling • Ti-Co® Galvanized Sheets • 4-Way® Safety Plate • Enameling Iron • Sub-Purlins



ONE OF 54 NEW DRYERPACS is shown on Barber-Greene Continuous Mix Plant. By offering the industry's broadest choice of dryer-dust collector combinations, only Barber-Greene gives you balanced components custom fitted to your plant capacity and your own operating conditions. Benefits: lower initial and operating costs, longer life, higher resale.

54 NEW BARBER-GREENE ANY PLANT CAPACITY

New line developed after comprehensive two-year tests breaks dryer bottleneck in hot mix production, assures top capacity per dollar of plant investment.

Barber-Greene's 54 new Dryerpacs take the guess and gamble from selecting the correct dryer-dust collector combination needed to produce lowest cost hot mix at any rate from 65 to 350 t.p.h.

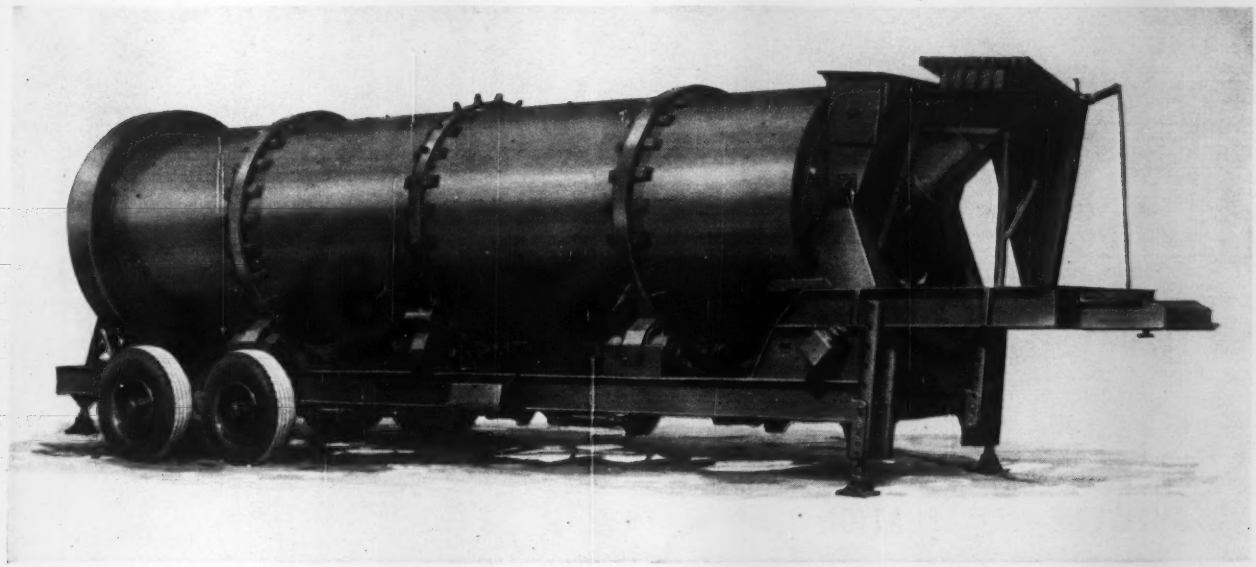
Now you can choose from 27 drying capacity ranges in either stationary or portable models. Drum sizes range from 5′ x 20′ to 9′ x 30′, and air flow capacities of 12,000 to 54,000 c.f.m. For small plants in the 30-65 t.p.h. range, you can select from two single chassis Dryerpacs.

Outgrowth of comprehensive test program

All 54 new dryer models offer optimum performance through scientifically balanced designs. By conducting the industry's most comprehensive dryer testing program, Barber-Greene was able to put the many interrelated factors influencing dryer performance in their proper perspective. And from this two year research program comes equipment that breaks the dryer bottleneck in asphalt plant production for more profitable operation.

Outstanding new dryer features include: exclusive cradle chain drive for up to four times longer chain life; self-adjusting seals that reduce fines loss and improve combustion; exclusive power driven clog-free rotary inlet chute; special Man-Ten steel plate used for drum shell handles heat stresses without warping; roto-elevator discharge eliminates pit, assures positive flow; and a complete selection of burners which can be equipped with automatic controls.

Call your Barber-Greene Distributor for assistance in selecting the Dryerpac custom fitted to your needs. You'll get further proof why the modern Barber-Greene BatchOmatic and Continuous asphalt plant lines lead the industry for lower cost high capacity production, most accurate and automatic operation, lower maintenance, and the ultimate in portability when required.



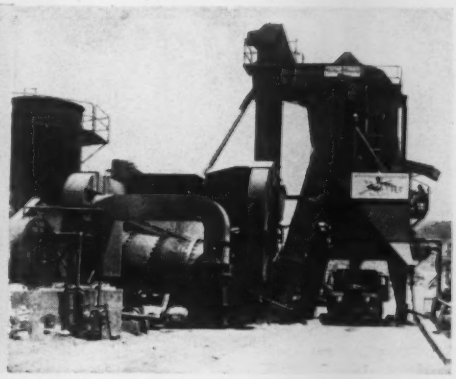
Barber-Greene Dryer Line offers industry's most advanced dryer design. All dryers in the DA series (20' drum) and DC series (30' drum) are offered in a selection of air flow capacities. Each dryer operates with capacity-balanced portable or stationary dust collectors as one system and assures you top plant capacity per dollar of plant investment.

DRYERPACS* CUSTOM FIT FROM 65 TO 350 T.P.H.

**Dryer-Dust Collector Combinations*

SEND FOR NEW BULLETINS. 16-page Dryer Principles describes and gives conclusions drawn from most comprehensive dryer testing program ever conducted. Dryerpac Bulletin shows many outstanding features of this 54-model line and presents for the first time the multitude of related factors required for optimum dryer performance. You'll find both brochures helpful in pointing the way to most profitable plant operation.

New Dryerpac line includes a complete selection of stationary drying equipment for either highway or urban batch plant operation. Matched Stationary Collectors offer flexibility in plant arrangement and disposition of collected fines. Two Wet Collector Series are available in a wide range of efficiencies to meet any air pollution code at the most economical level.



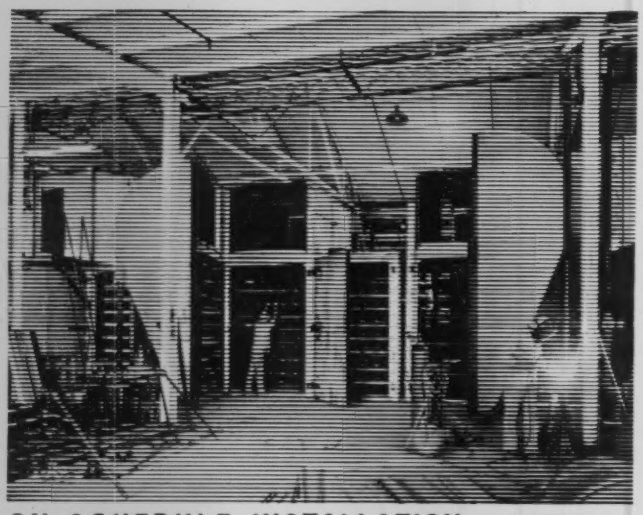
World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U.S.A.
Other Plants: DeKalb, Milwaukee, Detroit, Canada, England, Brazil, Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT



ON SCHEDULE INSTALLATION

Typical of Pacific Crane and Rigging's activities is this installation of a gypsum board conveyor and drying oven. Modification and installation of precision equipment with a minimum of down time is a P. C. & R. specialty.

For over 25 years P. C. & R.'s equipment and experienced personnel have successfully served industry on jobs as varied as one's imagination.

Pacific Crane & Rigging Co. MECHANICAL CONSTRUCTORS

NEvada 6-9213
MEtcalf 0-6020
6855 E. Rosecrans Ave., Paramount, Calif.

POLE RIGGING • MECHANICAL PIPING • CRANE SERVICE • SPECIAL PROJECTS • MISSILE EQUIPMENT • JACK & ROLLER RIGGING • EQUIPMENT SETTING

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with WATCO STEEL FORMS

SINGLE TEE FORM in closed position ready to pour

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P. O. BOX 1308 • PLANT CITY, FLA.

. . . New Products

One-Man Portable Hoist Goes as High as 170 Ft

The JUMBO, a portable hoist of 30-ft basic height, can be stretched to 170-ft height through addition of 5- and 10-ft sections.

One workman can either erect or lower the tower in one minute, according to the manufacturer. A 30-hp air-cooled engine powers the hydraulic erection unit.

Other notable features:

- A broken-cable safety device that locks the platform to the tower if the cable fails.
- An automatic brake that acts in case of power failure or pressure loss.
- Over-ride safety limits for the platform at top and bottom. TUBULAR STRUCTURES CORP. OF AMERICA, 4560 SPERRY ST., LOS ANGELES 39, CALIF.

Submersible Pump-Motor For Sludge and Slurries

Fairbanks, Morse has introduced a line of submersible pumps for large solids and stringy materials—industrial wastes, sewage, sludge and slurries.

The units may be equipped with an impeller of either two-blade or bladeless design. Both are made of one-piece cast iron.

Pumps are available in 2 in., 3 in., and 4 in. sizes.

The nonventilated induction motor, available in a range from ¾ hp to 7½ hp, has an oil-filled interior and finned exterior for rapid cooling. The shaft for the motor and pump is one-piece stainless steel.

Installation in any sump or pit requires only one piping connection and a plug-in electrical connection. FAIRBANKS, MORSE & CO., 600 S. MICHIGAN AVE., CHICAGO 5, ILL.

Theodore M. Penker, Jr., Vice President, Penker Construction Company, Cincinnati, Ohio, (left) with Bert Melching, his Dodge Representative.

"We can bid lower because Dodge Reports do our prospecting for us"

"Without the advance notice of prospects for new work that Dodge Reports give us," says Mr. Penker, "we'd have to maintain a much larger sales force to provide the same kind of information. We figure that could add 5 to 10% to our cost of sales and advertising . . . which might make the difference between *losing* or *winning* an award!"

"We cannot afford to miss a single valuable lead, since we can't hope to get more than a few of the jobs we bid on. This is why continuation of our business at its present levels without Dodge Reports would be almost *impossible!*"

Mr. Penker's company was formed in 1880 by his grandfather to build homes and small factories. Today it employs 300 to 400 men on various projects ranging from buildings to sewage, water and power plants, bridges, viaducts and highways. It is one of the three largest firms in southwest Ohio doing both engineering and building types of construction.

"Over the *35 years* that we've been using *Dodge Reports,*" Mr. Penker says, "their primary value to us has been the important advance news of new projects they provide. But they give us other benefits, too. They let the sub-contractors know which jobs we are bidding in plenty of time to submit *their* bids to us! What's more, Dodge Reports help us to know a large part of our possible market as much as two years ahead, thereby enabling us to plan on either curtailing or expanding our overhead, personnel and equipment requirements. This can be a vital factor in an operation of our size."

Every day, Dodge Reports give Penker Construction the kind of advance information they need – in time to take action. Dodge Reports can do the same for your company – at surprisingly low cost – regardless of your size or scope. Send the coupon for further information. Or, consult your telephone directory for the Dodge office (in over 80 principal cities) nearest you.

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I'd like to receive your free booklet, "How to Get More Business in the New Construction Field" and details on how Dodge Reports can help me increase volume and profits.

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New Products Briefs

• **Water softeners, filters**—New line of units under Rapidayton trade name is designed for removal of iron, sediment, taste, odor, acid and other objectionable elements in water. Line includes completely automatic push-button models as well as simple dial action models. The Tait Manufacturing Co., 500 Webster St., Dayton, Ohio.

• **Diesel pumps**—A new line of air-cooled, centrifugal pumps includes models with 2-, 3-, 4- and 6-in. openings and capacities from 250 to 1,500 gpm. They are powered by 4-cycle, air-cooled crank-start diesels with electrical starters as optional equipment. Rice Pump & Machine Co., Belgium, Wis.

• **Arc welder**—MCM-AC Bumblebee S Series units are designed for A.C. manual and automatic operation. According to the manufacturer, a mechanically operated, moving coil controls welding current and maximum arc response without steps. The units are available in 300 and 500 amp sizes and have a 60% duty cycle rating. Air Reduction Co., Inc., 150 East 42 St. New York, N. Y.

• **Sludge valve**—Telescoping valve has up to 4-ft travel. Sizes vary from 4 in. to 12 in. in 2-in. increments. The valves are controlled by either single-phase or three-phase motors normally. Manual operation is possible when power fails. The valves may be operated automatically if the process permits. The American Well Works, 100 N. Broadway, Aurora, Ill.

• **Pushbutton transit mixer**—Pushbutton controls located in the truck cab and at either end of the mixer operate the Transmatic concrete mixer. Designed for any truck with flywheel drive transmission, the unit has a drum drive cut-out switch for when maximum traction is needed. Hercules Galion Products, Inc., Galion, Ohio.

• **Electric arc gun**—Six-in-one electric arc gun serves as a spot welder, tack welder, button welder, hole burner and riveter. A hollow nozzle on the gun protects the user against flash and eliminates the need for a helmet. Holes and welds can be made in metal up to ¼ in. thick. Beeco Mfg. Co., Cranford, N. J.

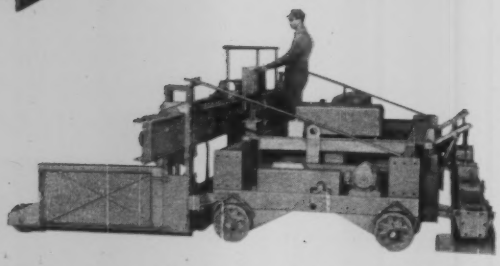
• **Combination pump**—Hydra-Jak, a combination pump that may be used for slab raising and leveling, sand-cement grouting, and backfilling sewers, tunnels and forms is powered by a 6-hp Wisconsin air-cooled engine. Performance rate during tests has been 85 cu ft per hour at pressures up to 150 psi. The 600-lb unit has wheel-barrow handles. Air Placement Equipment Co., Kansas City, Mo.

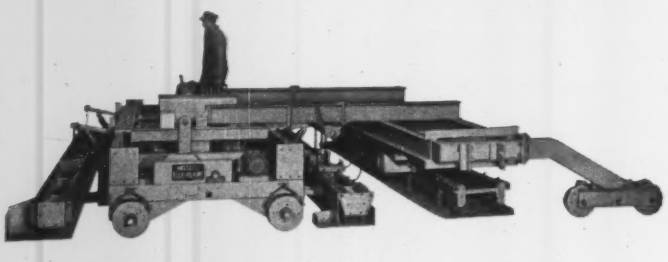
• **Mortar pump**—The Mor-Flo pumps up to 5 cu ft per min of gypsum or cement mortar or a light weight fireproofing or accoustical plaster. Available with gas or electric drive, the Mor-Flo has a self flushing valve that can be removed with one bolt for maintenance. Muller Machinery Co., Metuchen, N. J.

• **Beam clips**—Designed for flanges from ⅛-in. to ½-in. thick, Gat "B" beam clips will resist 50-lb vertical and 30-lb horizontal load. The clips will hold threaded bridle rings and drive rings. Light tapping with a hammer fixes them in place. Enrico Products, Inc., 2070 East 61st Place, Cleveland, Ohio.

NEW FLEX-PLANE SPREADER

← FEATURES SELF-CONTAINED HYDRAULIC WIDENING →





CONCRETE SPREADER — CHOICE OF TRACTION DRIVES. GAS-ELECTRIC — Infinite speeds in forward or reverse from 0 to 60 F.P.M. MECHANICAL TRANSMISSION — 10 forward speeds — maximum 77.8 F.P.M. — and 10 speeds in reverse.

COMBINATION FINISHER-FLOAT — Two pieces of paving equipment in one. Frames can be extended manually or hydraulically from 12′ to 26′. Gas-electric powered — separate screed and traction drives. (Send for Bulletin 59-5.)

• **Submersible pump**—Gorman-Rupp Co. has added a submersible dewatering pump to its line. The Model 3VS1 is a 3-in. centrifugal pump powered by a 5-hp, 3450-rpm, 60-cycle electric motor, available for single-phase 230-v, three-phase 220-v or three-phase 440-v operation. Unit with 75-ft electrical cable weighs 128 lb. Capacity range: 10 gpm at 120-ft head to 300 gpm at 10-ft head. Motor, seal and bearings run in oil and require no lubrication. GORMAN-RUPP CO., MANSFIELD, OHIO.

• **Cement flooring**—A new cement, Synthanite, is reported to produce crack-resistant and non-curling concrete floor toppings. AMERICAN SYNTHANITE CORP., 99 PARK AVE., NEW YORK 16, N. Y.

• **Adjustable shores**—Two types of screw-jack adjustable steel shores—extra strong and heavy duty—are available in six sizes varying from 5 ft to 16 .. high. The heavy duty shores permit greater spacing and widen passageways under the deck. ADRIA SALES ASSOCIATES, 85-02 104TH ST., RICHMOND HILL 18, N. Y.

• **Sludge pump**—An electrical submersible 4-in. pump, Flygt CS-100, has been developed for handling sludge, slurries, liquids and muddy water containing silt, weeds and other solids and, in general, solids of tooth paste consistency. The CS-100 combines a pump unit and 220/440-volt or 550-volt electric motor in aluminum housing. FLYGT CORP., HOOSICK FALLS, N. Y.

• **Soil tester**—An instrument called Dens-O-Meter measures moisture density in embankment and foundation soils. It is designed to be used in holes up to 0.5 cu ft in volume and 8 in. deep. One man can operate the unit in fine or coarse granular base soils and gravels. Parts are interchangeable with standard Model 30. CHARLES R. WATTS CO., 4121 SIXTH AVE., N. W., SEATTLE 7, WASH.

• **Fiberglass signs** — Fiberglass traffic signs are being produced in sizes, shapes and colors specified by the Bureau of Public Roads. They will last five times as long as metal signs, the manufacturer claims. FIBERGLASS SIGN CO., P. O. BOX 3042, CORPUS CHRISTI, TEX.

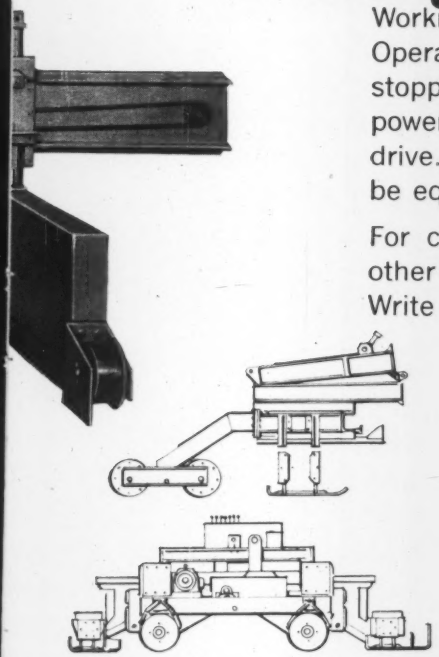
• **Floor repair**—Two ready-to-use plastic materials, Kwik-Set and Crack-Fix, can be smoothed on cracks, holes or worn areas in wood or concrete floors. Surfaces repaired with either product are ready to use instantly and both products are said to harden as traffic rolls over them. REVERE CHEMICAL CORP., 2010 EAST 102 ST., CLEVELAND, OHIO.

• **Fallout shelter**—A family fallout shelter made of corrugated pipe is priced from $995. The shelter also affords tornado protection. The unit is placed in a shallow pit covered with earth. It is big enough for six inhabitants and contains storage areas. FAMILY SHELTERS, INC., 2383 ORCHARD LAKE RD., PONTIAC, MICH.

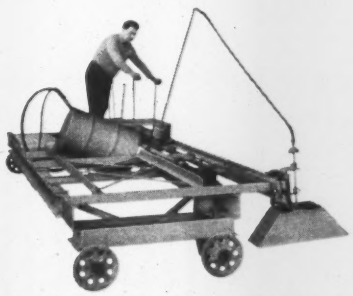
• **Four-speed digger**—An hydraulic hole digger with single-lever control has a super low gear, for digging in shale and hardpan, and three other speeds, which permit choosing the right speed for any particular job. Anchor holes may be dug at any angle using an auger that comes in sizes up to 30 in. in dia. TRUCK EQUIPMENT CO., DENVER, COLO.

another great addition to Heltzel's line of paving equipment. Working widths from 12′ to 26′ at speeds up to 77.8 feet per minute. Operator has complete control over spreading action — sweep can be stopped at any position and direction reversed. Features gas-electric power with separate motors and controls for screed, sweep, and traction drive. Pneumatic tired wheels for easy transport are optional. Can also be equipped with vibrator attachment mounted on sweep or screed.

For complete information about the new FLEX-PLANE SPREADER or other FLEX-PLANE finishing equipment, see your local Heltzel distributor. Write today for descriptive literature.



Finisher or float trailer can be purchased separately. Finisher section can be used singly as twin-screed finisher.



AUTOMATIC SPRAY-CURING MACHINE—Fast, economical method for applying membrane curing compound. Spray head is synchronized to machine travel for skip-proof, overlapping coverage. (Send for Bulletin 59-17.)

HELTZEL
FLEX-PLANE
THE HELTZEL STEEL FORM & IRON CO.
WARREN, OHIO

NOW—with the Scout®

ONLY INTERNATIONAL offers you such a wide range of all-wheel-drive trucks

From this tough little all-weather handyman to giants with 73,000 lb. GVW rating, INTERNATIONAL gives you today's most complete construction team! And INTERNATIONAL is in a class by itself for keeping you on schedule, too. A vast, nation-wide network of sales and service centers, plus 12 major parts depots, *makes sure of it.* Look at this line-up:

Always on the job: INTERNATIONAL model C-120(4x4) takes you in before the roads are in! GVW rating up to 7,000 lbs. This powerhouse has all-wheel bite and the famous INTERNATIONAL V-8 engine (6-cylinder and another V-8 model optional). Big 8½-foot box lets you bring along the whole construction shack on the first trip. Eight and 9-foot platform and stake bodies optional.

Grading, hauling, backfilling or blade-work: Versatile INTERNATIONAL model BC-180(4x4) can work any part of the job. This compact-design truck maneuvers easily in tight working conditions. Both front and rear have power take-offs to deliver INTERNATIONAL's full V-8 authority where you want it. Gasoline or LPG 6-cylinder engine optional, GVW rating up to 20,000 lbs.

Moving a 10-yard load of rock: Rugged INTERNATIONAL model RF-190(6x6) has the power and traction to do it—out from under the shovel and back on the road without bogging down. It will perform under the most foul weather conditions. Six-cylinder engines up to 212 hp., GVW rating up to 43,000 lbs.

Transit-mix with traction to spare: A bear for work off the road, the INTERNATIONAL model RF-210(6x6) chassis will take that transit-mix load anywhere. Rated up to 52,000 lbs. GVW, now it offers you all the advantages of new INTERNATIONAL live-tandem bogie. Six-cylinder engines up to 212 hp., power steering optional.

Need a dump truck right away? INTERNATIONAL will have one ready in 24 hours! Six-wheeler or single axle, your nearby INTERNATIONAL Truck Dealer or Branch can ship you the truck you select from their special Truck Sales Processing Center. It's one more example of the service INTERNATIONAL provides, to keep your job on schedule.

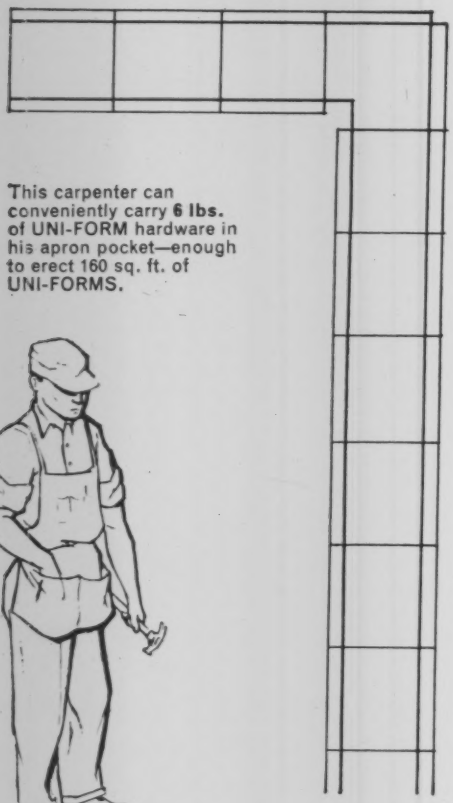
INTERNATIONAL® TRUCKS IH®

WORLD'S MOST COMPLETE LINE International Harvester Company, Chicago

Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

Off-road workhorse, hardtop pickup . . . you can count on the new, low-cost SCOUT to whip you out to the job site and back comfortably, economically. The SCOUT carries three men in the enclosed all-steel cab, hauls hefty loads in the 5-foot box. It strips down for even faster action, too—roof, doors and windows are removable in minutes, windshield folds down. Powered by tough, new INTERNATIONAL 4-cylinder COMANCHE engine to save you gas. Ask your SCOUT Dealer for full details now.

WHICH PREFAB FORM SYSTEM OFFERS MORE PRODUCTIVE FORMING TIME PER DAY?



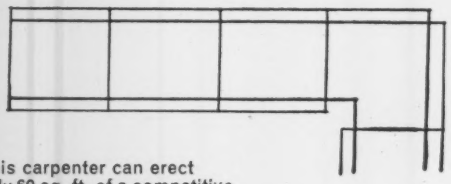
This carpenter can conveniently carry **6 lbs.** of UNI-FORM hardware in his apron pocket—enough to erect 160 sq. ft. of UNI-FORMS.

UNI-FORM SYSTEM

Carpenters can form more contact area per hour with UNI-FORM Panels than they can with any other prefab form system. The reason? It takes less hardware — in most cases, 50% less — to form a given contact area. And UNI-FORM hardware **weighs less, costs less,** and is easier to install.

EXAMPLE: **6 lbs. of UNI-FORM hardware — 128 Tie Keys — are required to install 32 UNI-FORM Ties (4 keys per tie).** 32 Ties are required to erect 160 sq. ft. of UNI-FORM Panels.

Cost of hardware required to install 1 UNI-FORM Tie: **LESS THAN 4¢.**
(Tie Keys are re-usable)



This carpenter can erect only 60 sq. ft. of a competitive prefab system's panels with the **6 lbs.** of hardware he carries in his apron. **Extra trips for hardware means less productive forming time.**

COMPETITIVE PREFAB FORM

A leading competitive prefab form system requires 2 tightening wedges and 2 connecting bolts per tie installed. **In 6 lbs. of this hardware, there are only 24 sets of wedges and bolts — enough for 12 ties.** 12 ties will assemble **only 60 sq. ft.** of this system's panels.

Cost of hardware required to install 1 competitive tie: **36¢.**
(Wedges and Bolts are re-usable)

WHICH PREFAB FORM SYSTEM GIVES YOU FASTER FORM ERECTION AND LOWER COSTS? Want more information about UNI-FORM Panels and the advantages they can bring to your concrete forming? Write today for complete details.

UNIVERSAL FORM CLAMP CO. 1238 N. KOSTNER AVENUE • CHICAGO 51, ILLINOIS

BRANCH OFFICES and WAREHOUSES:
ATLANTA BALTIMORE CLEVELAND HOUSTON
LOS ANGELES SAN LEANDRO TORONTO

Steel Institute Elects Lewis

The American Institute of Steel Construction has elected Harold G. Lewis as president to fill the unexpired term of James M. Straub, who died last month. Mr. Straub, president of Fort Pitt Bridge Works, had been elected for a one-year term last November.

Mr. Lewis, president of the Flint Steel Corp. in Tulsa, Okla., will be the active executive officer of the organization, which represents over 300 companies engaged in producing 70% of the country's fabricated structural steel.

A native of Kansas, he graduated as a civil engineer from Kansas State university in 1928 and joined Flint a year later. In ten years he moved up to vice president and general manager of Flint Steel. He was named president in 1950. He is also vice president of the Braden Steel Corp. and the Tulsa Rig, Reel and Manufacturing Co., both of Tulsa.

Mr. Lewis was first elected to the AISC board of directors in 1955. From 1958 to 1960 he served as second vice president and last November he was elected first vice president.

Harold G. Lewis

Mr. Straub, 61, had been a director of the institute since 1949. He had joined Fort Pitt Bridge Works in 1920 and was elected president of that firm in 1940.

Briefs . . .

Associations

H. E. Lore, manager of Dravo Corp's engineering and construction department in Pittsburgh, has been elected president of the National Constructors Association. He succeeds **D. W. Darnell,** Board Chairman of Fluor Corp., Ltd., of Los Angeles.

President of the Standards Engineers Society for 1961 will be one of its founders, **Harold R. Terhune,** manager of standards at International Telephone and Telegraph Laboratories.

The Portland Cement Association has named **H. A. Sawyer** to succeed **Cris Dobbins** as chairman of the board of directors. Mr. Sawyer is board chairman and president of the Lone Star Cement Co., New York City.

W. Douglas Porter, vice president and general manager of Mid-Canada Contractors Ltd., Toronto, has been elected president of the Pipe Line Contractors Association of Canada.

Lester R. Kennedy, president of the Dakota Lime and Brick Co., Rapid City, S. Dak., has been elected president of the National Concrete Masonry Association for 1961.

The Metal Lath Manufacturers Association has elected **Maurice K. Brown** to head the organization this year. He is vice president of Penn Metal Co., Inc., Boston.

John T. McCann has been named executive vice president of the Mechanical Contractors Association of America, Inc. He was formerly director of industrial relations of General Bronze Corp.

James M. Rice, of the Natural Rubber Bureau in Washington, D. C., has been elected president of the Association of Asphalt Paving Technologists. Mr. Rice advises the Natural Rubber Bureau on the use of rubber in roads.

Bristow Guy Ballard, vice president of the Canadian National Research Council, has been elected president of the Engineering Institute of Canada. He joined CNRC in 1931 and became vice president (scientific) in 1954.

Walter L. Shouse, director of Kentucky's Division of Planning and Zoning, has been chosen president of the Southern Association of State Planning and Development Agencies. He has headed the Kentucky unit since 1956.

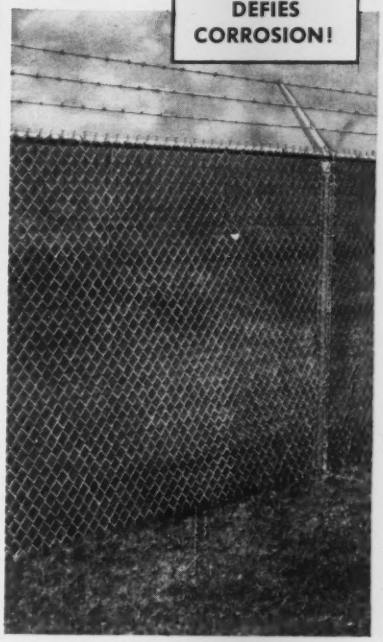
L. P. Street, of the American Bituminals & Asphalt Co., Baltimore, has been named by the Asphalt Institute to succeed **E. M. Stone** as chairman of the board of directors.

E. S. Preston, Ohio Director of Highways, is the new chairman of the Mississippi Valley Conference of State Highway Departments.

NOW!

ALL ALUMINUM CHAIN LINK FENCE

NO PAINTING! • DEFIES CORROSION!



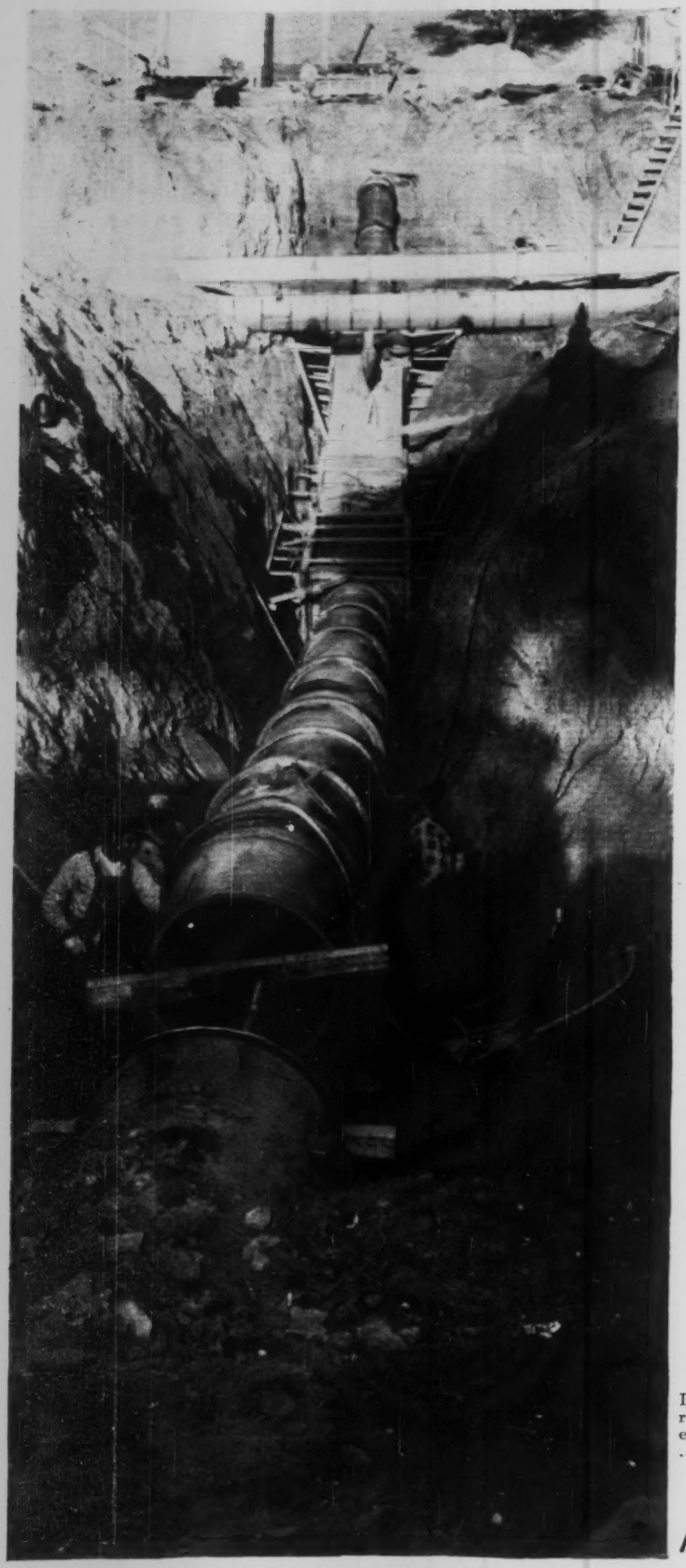
Aluminum cuts your maintenance costs on fencing to nearly nothing! And new high-strength alloys assure a fence that will stand solid, straight and handsome through the years!

That's why Aluminum Chain Link is specified for more and more industrial plants, highways, parks and playgrounds.

Call your Anchor Man for more information. Write for free catalog: Anchor Fence, Dept. EN4, 6661 Eastern Ave., Baltimore 24, Maryland.

ANCHOR FENCE made of REYNOLDS ALUMINUM

Watch Reynolds TV show: "HARRIGAN AND SON," Friday evenings, ABC-TV Network.



DON'T BE FOOLED BY INITIAL PIPE COSTS...

Certain factors concerning the type of pipe to be used for a proposed water or gas project must be examined carefully:

First
—how much does the pipe cost, compared to other types?

Second
—how often will it require repair?

Third
—how long before it has to be replaced?

After all, how much money do you really save if you buy the cheapest pipe . . . then have to repair it frequently . . . and *then* have to replace it within a decade or two?

You save with cast iron pipe

Sometimes the first cost of jobs where cast iron pipe is specified, is higher than similar projects using cheaper pipe. Yet, in the long run, cast iron pipe costs *less!* Here's why:

- Cast iron pipe rarely requires repairs. Its rugged construction, corrosion-resistant qualities and bottle-tight rubber-ring joints will withstand the most severe pressures. Once an investment is made in cast iron pipe, it is usually your first and last cost because of the absence of maintenance or repairs.

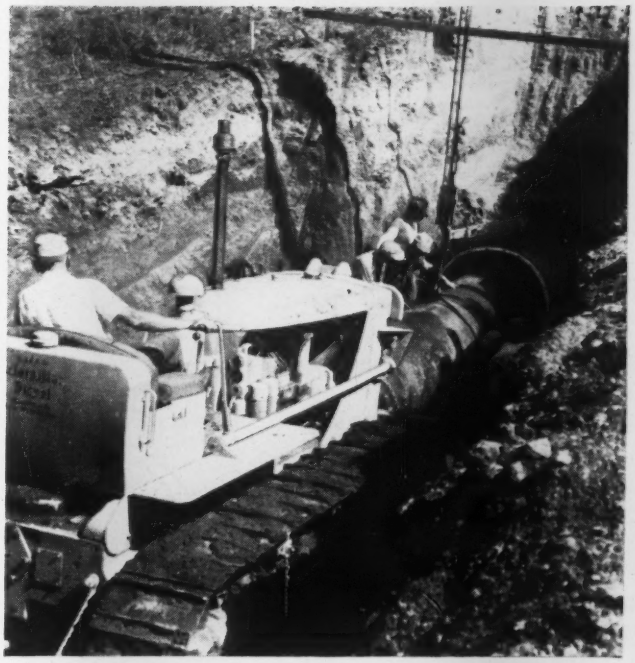
- Cast iron pipe is built to *last*—98 American cities will testify to that. They've had cast iron pipe installations in constant use for over a century! In fact, in Versailles, France, they're still using cast iron pipe water mains that were laid in 1664! Once cast iron pipe is in the ground, it stays there!

Don't be fooled by "low-cost" pipe. Insist on the pipe that will actually save you money over a period of years . . .

In Nebraska—Here a section of cast iron pipe is being relocated. Twenty-five years old, the pipe is still in excellent condition—has never required major repair . . . or replacement.

Rely on CAST IRON PIPE

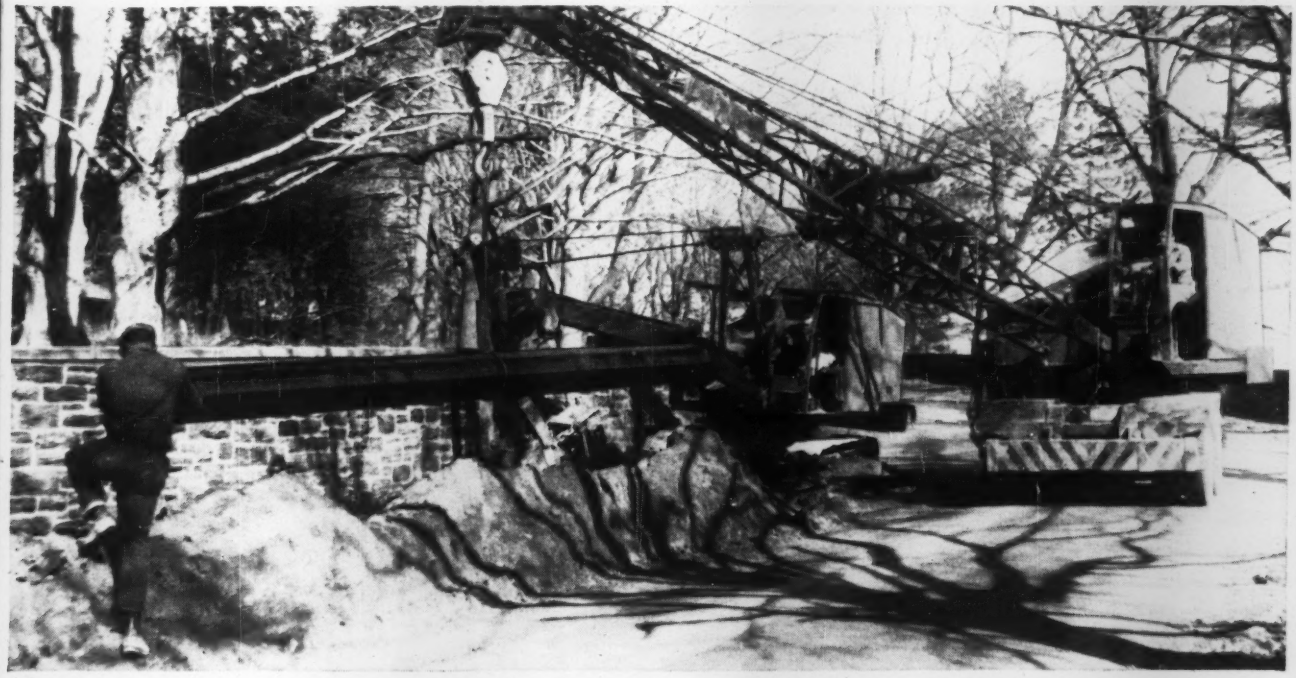
In Indiana (above)—"All-weather" cast iron pipe is quickly installed despite wet trench conditions. Slip-on joints were easily assembled, with one workman using a crowbar.



In Kansas (above)—36" cast iron water main. Another part of this main was floated out of its trench by a heavy downpour. Later a 150 psi water test revealed no leaks in the slip-on joints!

In Pennsylvania (below)—This 16" cast iron pipe is being installed as fast as the trench hoe can prepare the trench.

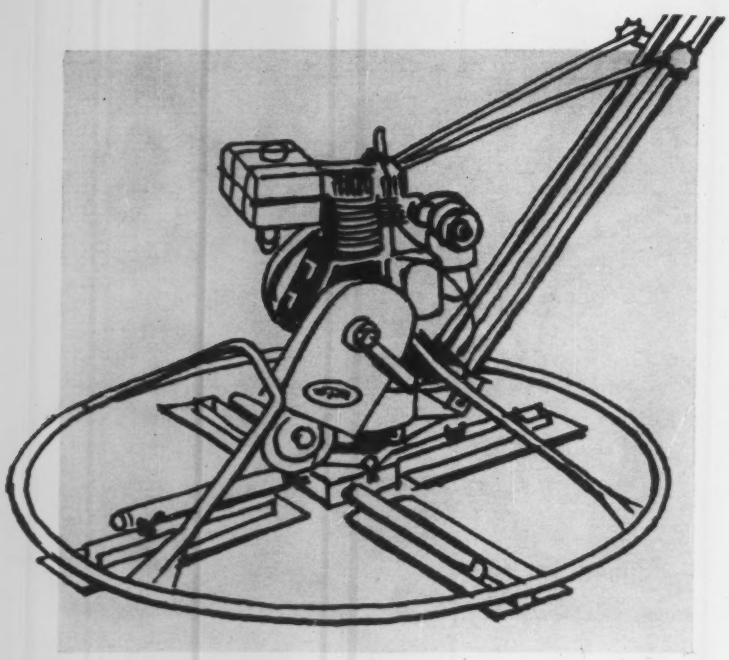
Handy lengths and slip-on joints make cast iron pipe easy to handle, even in crowded neighborhood sectors; require less labor.



CAST IRON PIPE

THE MARK OF THE 100-YEAR PIPE

Cast Iron Pipe Research Association,
Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois



FINEST TROWELING MACHINE WE'VE EVER USED

That's the word on the STOW G46B TROWEL from a construction superintendent who has bought and used them all! According to the operator on this particular job, the G46B is the smoothest finishing, easiest-to-use machine he has ever handled. And remember, this G46B trowels 83% more area per revolution than any 34" machine!

We have lots of testimonials on the way STOW ROTO-TROWELS perform... statements from contractors telling us how they saved time and made money by putting STOW TROWELS on the job.

But why not see for yourself? Call your nearest STOW Distributor. He'll be happy to demonstrate the STOW TROWEL line for you — in any troweling situation.

For up-to-date information on the complete line of STOW CONCRETE CONSTRUCTION EQUIPMENT, write for Catalog 610.

STOW

Trowels available in 29", 34", 42", and 46" diameters.

WARRANTED FOR ONE FULL YEAR

STOW MANUFACTURING CO. DEPT. E-7 19 SHEAR ST., BINGHAMTON, N. Y.

Obituaries

Lawrence P. Larkin, 60, an associate with Ammann & Whitney, New York City firm of consulting engineers, and a specialist in planning parkways, expressways and turnpikes. While with Ammann & Whitney, he had charge of planning for the Washington International Airport; the Milwaukee Expressway system; Horace Harding and Long Island Expressways; and the approaches to the Walt Whitman Bridge in Philadelphia, the Narrows Bridge in New York City and to the new lower deck of the George Washington Bridge in New York City.

Charles O. Edmonds, 59, construction superintendent for the American Bridge Division of U. S. Steel, in an accident at the Navy's radio telescope project at Sugar Grove, W. Va. In the 39 years he had been with American Bridge, he had supervised all types of steel construction, including the superstructure of the twin Carquinez Bridge over San Francisco Bay.

Joseph Weaver, 64, chairman of the board of Spencer, White & Prentice, Inc., contractors and engineers in New York City. He had joined Spencer, White & Prentice in 1922 as a field engineer, became president in 1956, and was named chairman of the board in 1960.

William B. Crombie, 74, retired engineer who had built and managed some of Ontario's largest hydroelectric projects. He was consultant for Ontario on railroad relocation for the St. Lawrence power project when he retired five years ago.

Winfred E. Reynolds, 80, retired senior vice president and director of Ford, Bacon & Davis, Inc., New York City engineering and management consulting firm. He had retired in 1947 after 28 years of working with Ford Bacon & Davis.

A. Kingsley Ferguson, 48, vice president of Walter Kidde Constructors, Inc., and former president of H. K. Ferguson Co. While with his father's firm, he had built industrial plants for General Electric, Westinghouse, Pittsburgh Plate Glass, Procter & Gamble, General Foods and Corn Products.

Frederick A. Godley, 74, a member of the architectural firm of Hood, Godley & Fouilhoux, New York City. He participated in the design of Rockefeller Center, the News Building and the McGraw-Hill Building, all in New York City.

SPECIFY A *Proven* SUBMERSIBLE PUMP

SPECIFY "weil"

weil Submersible Sewage and Sump Pumps have been in use since 1951. There is no substitute for experience.

NOW AVAILABLE in a choice of two motors

1750 R.P.M. and Low Speed 1140 R.P.M. for longer life, less wear and improved non-clog characteristics.

NOW AVAILABLE with a choice of two controls

Conventional float switch

MICRO Pressure switch (as illustrated)

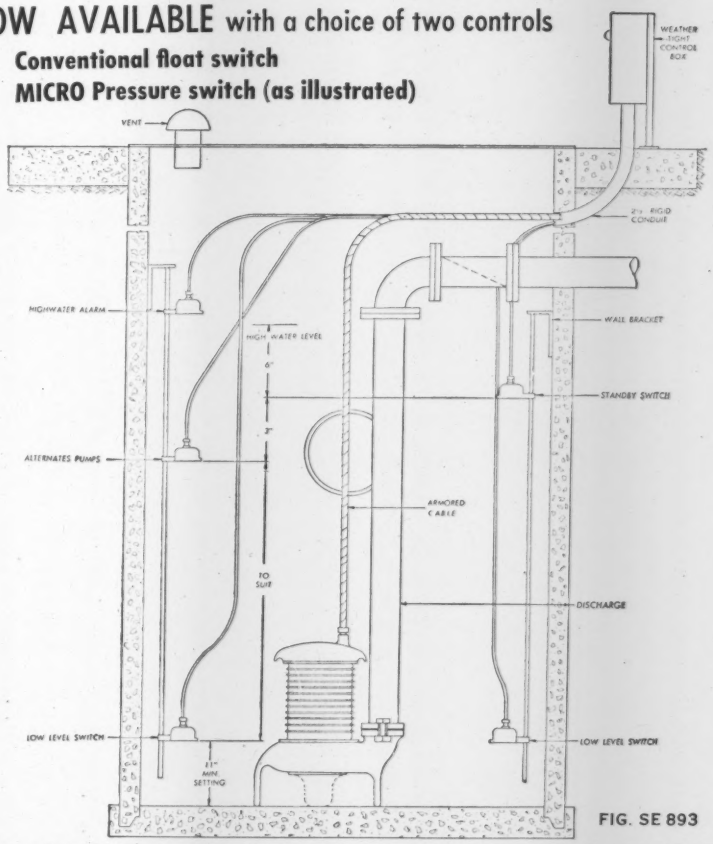


FIG. SE 893

Illustrated is a Duplex Installation of two **weil** Submersible Sewage Pumps employing MICRO Switch controls to start and stop pumps; to alternate pumps; and to provide for high water alarm. Note the ease with which switches are positioned (or changed) to control water levels. The Submersible MICRO Switch has no exposed moving parts, needs no servicing and coupled with the **weil** Submersible Pump provides an extremely efficient non-clog trouble-free pumping system.

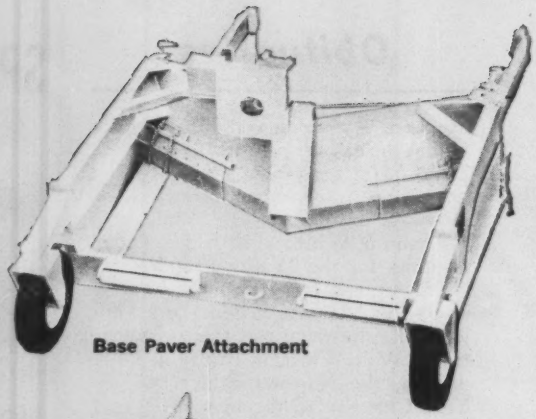
weil Submersible Pumps are manufactured in discharge sizes of 3" to 6" and capacities to 2000 G.P.M. There is a **weil** Submersible Pump to meet all requirements. **Now approved by the CANADIAN STANDARD ASSOCIATION Testing Laboratories.**

Send for Bulletin SE-860 for complete engineering information.

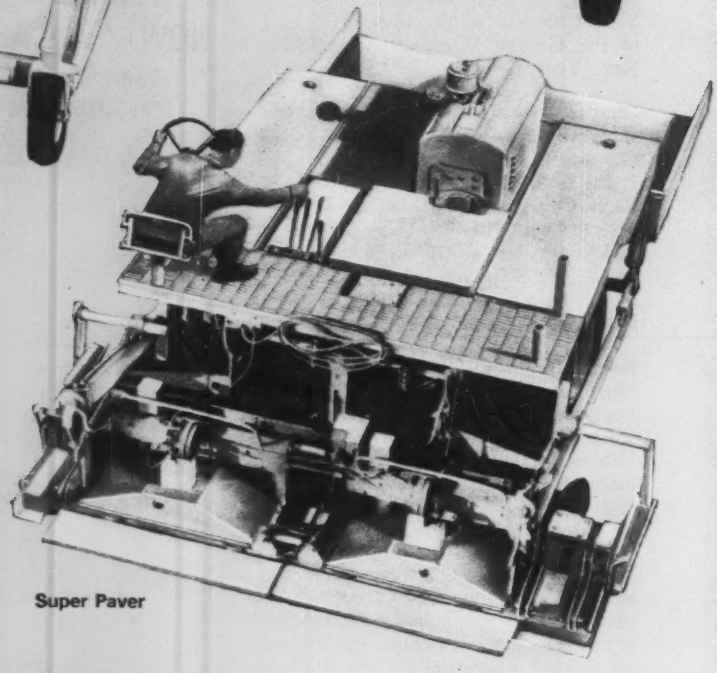
weil PUMP COMPANY

1528 North Fremont St. • Chicago 22, Ill.

Self-Propelled Base Paver



Base Paver Attachment



Super Paver

Self-Propelled Base Paver—Big capacity unit spreads stone, slag, gravel, soil cement or plant mix aggregates 1" to 20" deep in widths from 10'-10" to 16'-0", at the rate of more than 400 t.p.h. Tractor unit is equipped with 21" wide crawler shoes for maximum traction and flotation on softest base. Equipped with high-speed oscillating screed, front wheel power steering, dual controls. Four forward and four reverse working speeds, one forward and reverse travel speed.

Base Paver Attachment—Big capacity unit designed especially for use with standard tractors of sufficient power. New universal hitch makes attachment easy. Equipped with its own engine-driven oscillating screed, and mechanical crown adjustment. Spreads stone, slag, gravel, soil cement and plant mix aggregates 1" to 20" deep in widths from 10'-10" to 16'-0". Hopper lifts completely for travel.

Super Paver—Automatic, air-electric fingertip controls, 12-ton hopper with hydraulic folding wings. Independent control of left and right conveyors interlocked with control of augers. Automatic control of material level ahead of augers. One piece screed in 10' width with extensions to 19'. Hydraulically driven tamper. Full hydraulic wheel steering. Eight paving speeds from 16 f.p.m. to 117 f.p.m. Four forward and reverse travel speeds from 6 to 11 m.p.h.

Drive wheels equipped with 16:00 x 25 low-pressure earth mover tires. Full power brakes. Gasoline or Diesel power plant. Option: revolutionary new grade control for averaging out grade imperfections, determining grade from guide devices, adaptation to previously cut grade variations and matching previously laid mat.

Suburban Paver—Automatic control, 4-ton hopper, hydraulic folding wings. Right and left conveyors synchronized with augers. One piece screed with extensions to 12'. Full hydraulic wheel steering. Five paving speeds from 10 to 127 f.p.m. Travel speed 8.6 m.p.h. New hydraflated 10:00 x 20, 12-ply tires, and locking differential. Option: new grade control for averaging out

THE NEW LOOK IN BITUMINOUS PAVING:

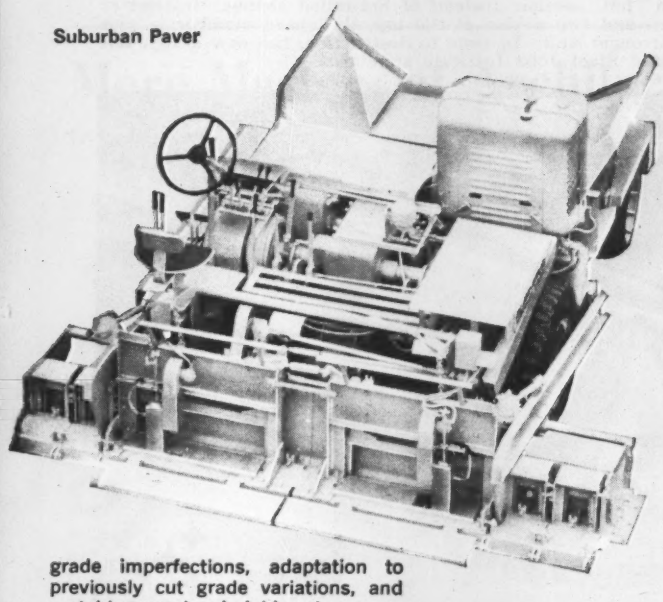
MORE AUTOMATIC,

Here's the bituminous paving line designed to give you top quality, fully automatic production from base course to final binder.

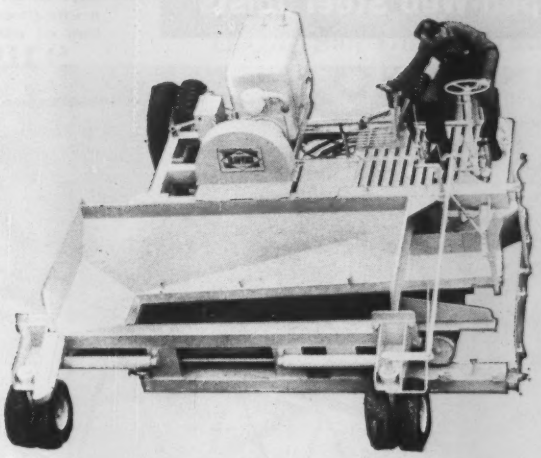
Check the automatic features, the capacity and versatility of these new and improved Blaw-Knox machines. They'll help you bid closer, work tighter and make more money starting right now.

Your Blaw-Knox distributor has all the information. He'll be glad to help you get started on the way to bigger paving profits. Blaw-Knox Company • Construction Equipment Division • Mattoon, Illinois.

Suburban Paver



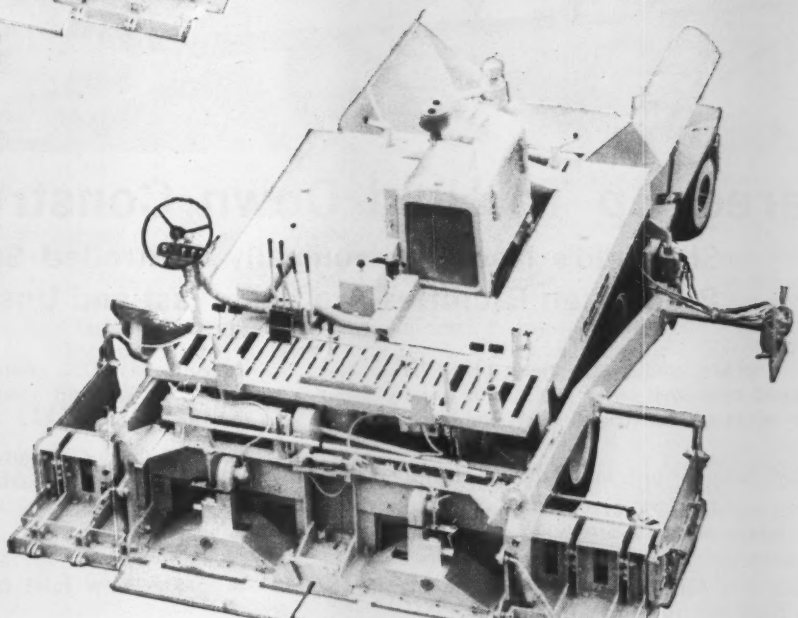
Road Widener



grade imperfections, adaptation to previously cut grade variations, and matching previously laid mat.

Road Widener—Versatile, one-man unit spreads any kind of aggregate, lays all types of bituminous mixes, spreads and finishes concrete. Spreads aggregate and bituminous materials in 2′ to 10′ widths, spreads and finishes concrete in 2′ to 6′ widths. 15′ slip form attachment for concrete widening. Strike-off gate assemblies for each type material used. Spud vibrators for low slump concrete.

Express Paver—Automatic air-electric fingertip controls, 10-ton hopper with hydraulic folding wings. Independent control of left and right feed conveyors interlocked with control of augers. One piece screed design with extensions to 16′. Full hydraulic wheel steering. Eight paving speeds from 10 to 62 f.p.m. Travel speed 7 m.p.h. New hydraflated 10:00 x 20, 12-ply tires. Gasoline or Diesel power plant. Option: new grade control for averaging out grade imperfections, determining grade from guide devices, adaptation to previously cut grade variations and matching previously laid mat.



Express Paver

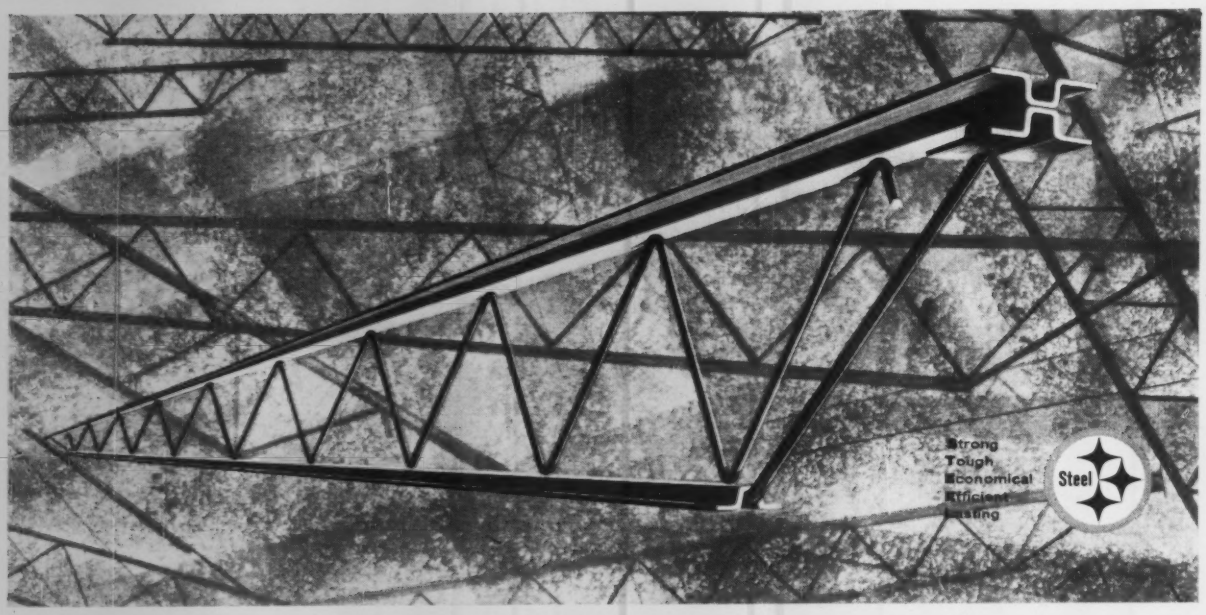
VERSATILE, RUGGED THAN EVER BEFORE!

BLAW-KNOX

Construction Equipment

SHEFFIELD
Open-Web Steel Joists

A new design. The visible difference of the new Sheffield S-series joist is that both top and bottom chords are made of cold-rolled strip steel formed into a "hat" section, instead of hot-rolled shapes. Instead of bars at bottom and two angles at the top, the chord member is now a one-piece, stronger unit. In tests to destruction, the new design has met or exceeded Steel Joist Institute standards.



Geared Up To Hold Down Construction Cost!

Sheffield's New Electronically Controlled Steel Joist Production Facilities Are Vast, Fast and Unsurpassed

Now you can key your design plans to Sheffield's newly designed open-web steel joists with greater assurance of effecting construction economies than ever before.

1. Tripled capacity in a brand new fabricating plant—
2. —equipped for fast, precision production with the very latest electronically controlled cold forming machines—
3. —assures a full measure of the benefits flowing from high productivity in volume—
4. —affords the economies derived from dependable on-schedule shipments to meet construction schedules.

Add these advantages to design economies which stronger, lower deadload joists make possible and you come up with competitively substantial structures at lower cost.

The steel that goes into Sheffield Joists is made in Sheffield's own mills to specifications and under quality controls. This enables Sheffield to make double sure that Sheffield joists meet Steel Joist Institute specifications.

Your Sheffield distributor and nearest Sheffield office will co-operate in making available detailing service on your projects.

New Joist Data Book — Free!

40 pages of up-to-date and complete data on new Sheffield S-series and on Sheffield L-series joists. Contains properties and dimension data, load design tables, floor, roof and ceiling applications and accessories data, revised Steel Joist Institute specifications and recommended code of practices. For this complete working manual, write: **Sheffield Division, Armco Steel Corporation, Sheffield Station, Kansas City 25, Missouri.**

ARMCO **Sheffield Division**

More Masters of Architecture

LOUIS SULLIVAN—by Albert Bush-Brown. WALTER GROPIUS—by James Marston Fitch. RICHARD NEUTRA—by Esther McCoy. OSCAR NIEMEYER—by Stamo Papadaki. ERIC MENDELSOHN—by Wolf Von Eckardt. 128 pp. each. George Braziller, Inc., 215 Park Ave. South, New York 3, N. Y. $4.95 each.

Five monographs in individually bound volumes have been added to the "Masters of World Architecture" series, which was started last year (ENR Oct. 20, 1960, p. 81).

Louis Sullivan, now famed for his skyscraper designs in the late nineteenth century, led a life-long fight against the architectural traditions of his time. His ideas and building innovations are set against the background of this fight in the book on his works. One section of the text is devoted to a detailed analysis of his organic theory of architecture.

Walter Gropius, as director of Germany's pre-World War II Bauhaus, established architectural theories to fit into an industrialized society. The book on his works discusses his theories and some of his projects based on them. The author stresses that Gropius' ideas are not confined to a static system; he is pictured as exploring new materials with which to solve new design problems.

The architectural career of Richard Neutra—including encounters with some of his teachers, among them Frank Lloyd Wright—is traced in the book on his works.

Also included in the text are brief structural descriptions of some of his home designs in California. Special sections are devoted to school construction and city planning, two of Neutra's specialties.

Oscar Niemeyer's buildings not only fit into Brazilian life, they form an integral part of it through his plans for Brasilia, the world's newest capital. The book on his works, however, is disappointing in that it only briefly discusses this project.

Most of the text is on general trends in modern architecture, incorporated within a thumbnail sketch of Niemeyer's life.

Eric Mendelsohn is described as an artist working through the mediums of steel and concrete. His structures of the 1920's, with their sweeping contours, suggest a plasticity that anticipates Frank Lloyd Wright's Guggenheim Museum.

One section of the book on his works elaborates on modern religious structures, a field in which Mendelsohn set many trends.

Caught With Their Plans Down

THE SQUEEZE—Cities Without Space—by Edward Higbee. 348 pages. William Morrow & Co., New York, N. Y. $5.95.

"If a community must first misuse land, create congestion, license inefficiency, and promote dissatisfaction before it is shocked into seeing the importance of rational space allocation, there can be no hope. We shall have to live with folly if we are not wise enough to prevent it."

This quote from Mr. Higbee's book summarizes his view of the problems accompanying population growth and urban expansion. The author takes a long view into the past and future, showing the fantastic expense of failure to plan in the past and predicting an even higher price for procrastination in the future.

As one illustration of this high cost, Mr. Higbee cites the acquisition costs for a highway in Nassau County, New York. Only six years after completion of a surburban split-level housing development, 350 of the homeowners were informed by the state highway department that their property had been condemned for an expressway. For this tract, land cost to the state in 1959 was about $50,000 per acre; ten years earlier it would have been $2,000 to $4,000 per acre; and twenty years earlier it could have been acquired for $200 to $300 per acre.

In other words, far-sighted planning would have reduced the acquisition cost 250 times, planning would have reduced the cost 15 times and no planning resulted in a $3-million-per-mile price for land alone.

Engineers and planners should study Mr. Higbee's proposals for avoiding such waste in the future.

Establishment of municipal space banks, tax reform to help the cities regain their lost status, the plight of the railroads, and the effect of the federal-aid highway program on the nation's over-all transportation system are among the problems and proposals discussed in some detail.

Taking Salt Out of Water

SALINE WATER CONVERSION—Edited and produced by American Chemical Society Applied Publications. 246 pages. American Chemical Society, Washington 6, D. C. $5.85.

This book is a collection of papers comprising a symposium on saline water conversion presented at the American Chemical Society's Cleveland meeting last year.

Various papers treat individually the different methods of desalting water—long-tube vertical evaporation, multistage flash evaporation, electrodialysis, freezing, solvent extraction and solar distillation. Others deal with specific plants or with general problems, such as corrosion, scale deposition and thermodynamics of conversion. One paper describes the federal saline water conversion program. Diagrams and photos illustrate the papers.

Science Encyclopedia

MCGRAW-HILL ENCYCLOPEDIA OF SCIENCE AND TECHNOLOGY—Edited by William H. Crouse. 15 volumes. 9,712 pp. McGraw-Hill Publishing Co. $175.

A comprehensive summary of current knowledge of the various fields of science and engineering that would be useful to nonspecialists in each field is packed into these 15 volumes. College undergraduates should be able to comprehend most of the articles. Nevertheless, each subject is covered in depth.

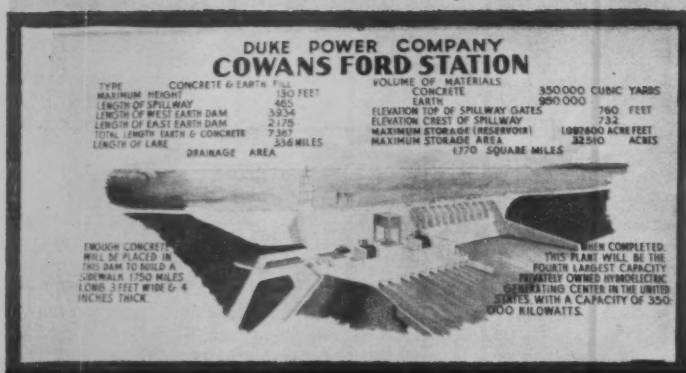
Preparation of the encyclopedia was directed by a seven-man editorial advisory board of outstanding engineers and scientists and 63 consulting editors, all experts in their respective fields. More than 2,100 specialists contributed the 7,200 articles in the work.

The basic purpose was "to provide the widest possible range of articles that will be understandable and useful to any person of modest technical training who wants to obtain information outside his particular field of specialization."

The editors have succeeded in achieving this. The articles are concise, clear and written in as simple language as each subject permits.

The basic subject matter of all the natural sciences and their major applications in engineering, agriculture, forestry, industrial biology, food and other technologies are included. But only the preprofessional science of the behavioral sciences, medicine, pharmacy and pharmacology are covered.

How to drown a valley—


DUKE POWER COMPANY
COWANS FORD STATION
TYPE CONCRETE & EARTH FILL
MAXIMUM HEIGHT 130 FEET
LENGTH OF SPILLWAY 465
LENGTH OF WEST EARTH DAM 3934
LENGTH OF EAST EARTH DAM 2175
TOTAL LENGTH EARTH & CONCRETE 7367
LENGTH OF LAKE 33.6 MILES
DRAINAGE AREA
VOLUME OF MATERIALS
CONCRETE 350 000 CUBIC YARDS
EARTH 950 000
ELEVATION TOP OF SPILLWAY GATES 760 FEET
ELEVATION CREST OF SPILLWAY 732
MAXIMUM STORAGE (RESERVOIR) 1 087 600 ACRE FEET
MAXIMUM STORAGE AREA 32 510 ACRES
1770 SQUARE MILES
ENOUGH CONCRETE WILL BE PLACED IN THIS DAM TO BUILD A SIDEWALK 1750 MILES LONG 3 FEET WIDE & 4 INCHES THICK
WHEN COMPLETED, THIS PLANT WILL BE THE FOURTH LARGEST CAPACITY PRIVATELY OWNED HYDROELECTRIC GENERATING CENTER IN THE UNITED STATES WITH A CAPACITY OF 350 000 KILOWATTS.

DUKE POWER COMPANY'S CEDARAPIDS PLANT

- 42" x 48" Single Jaw Crusher Primary
- 5' x 12' Inclined Scalping Screen
- 4¼' Symons® Standard Cone Crusher
- 4' Symons® Short Head Cone Crusher
- Two 5' x 14' Horizontal Vibrating Screens
- One 4' x 12' Horizontal Vibrating Screen
- One 5' x 12' Horizontal Vibrating Screen
- 40" x 16'6" Heavy-Duty Model CSF Feeder
- 13 "Strigid" Lattice Frame Conveyors

(Symons—a registered Nordberg trademark)

—with Cedarapids production

300 TONS PER HOUR of 100% crushed aggregate! That's the way to get a dam job finished in a hurry . . . and that's exactly what Duke Power Company is doing with this cleanly-engineered Cedarapids Stationary Plant. The job is the Cowans Ford hydroelectric project, 22 miles northwest of Charlotte, North Carolina, on the Catawba River. Duke Power Company is supplying its own needs for strict specification aggregate. Crushing 90% granite and 10% diorite, with the 42″ x 48″ jaw crusher set at a 6″ opening, they are producing four sizes . . . −6″ plus 3″; −3″ plus 1½″; −1½″ plus ¾″; and −¾″ plus #4.

A different dam job, or a highway job, or any other job requiring aggregate, demands an entirely different crushing plant set-up . . . and that's where you profit with a Cedarapids-Engineered Plant. Cedarapids-Engineering means a plant tailor-made for *your* specific conditions, with each component production-balanced with all the others to assure highest capacity at lowest cost per ton. Your near-by Cedarapids Dealer can explain the advantages of Cedarapids-Engineering, or write direct to:

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

Here is the pace-setter for Duke Power's big project. It's the Cedarapids 42" x 48" Single-Jaw Primary Crusher which is engineered with the greatest combination of high-capacity features ever built into a jaw crusher! If you need higher primary capacity, ask for more information.

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STATIONARY PLANT
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Gentlemen: Please send details about Cedarapids-Engineering assistance for my stationary plant operations.

SHORT CUT TO LONG LINES

Save Work and Speed the Job with NAYLOR Pipe and Wedgelock Couplings

For air, water and ventilating lines, you'll save time and money with this NAYLOR combination.

NAYLOR pipe is light in weight, easy to handle and install. Its lock-seamed, spiralwelded structure assures extra strength and safety.

WEDGELOCK couplings provide a positive connection securely anchored in standard weight grooved ends. Speed the job. A hammer is the only tool required to connect or disconnect them. Available in low-pressure and heavy-duty types.

Write for Bulletin No. 59 on pipe, fittings and couplings.

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Eastern U. S. and Foreign Sales Office
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Some Transportation Basics

AN INTRODUCTION TO TRANSPORTATION ENGINEERING—by William W. Hay. 503 pages. John Wiley & Sons, Inc., New York, N. Y. $11.75

A gap is said to exist in transportation textbook material between structural design and economic functioning (cost, rates, regulation) of the various kinds of transportation. To fill the gap the author has written about "the technological utility of the various modes of transport in moving persons and goods."

The book deals with the effect of technological factors on movement and the principles involved. Conventional boundaries that have separated railways, highways, waterways, airways, etc. into unrelated compartments have been eliminated by using a unified approach to the subject.

Initial coverage is given to transportation's place and function, development and history and the transportation system.

Transport technology is then examined, including roadway, technological characteristics (such as guidance and maneuverability, buoyancy and stability) and propulsive forces. (Some of the terms used may sound strange to highway engineers; e.g., both asphaltic concretes and portland cement concretes are classed as "heavy-duty rigid pavements.")

Middle third of the book covers factors in operation: operating characteristics, terminals, coordination of services and operational control.

Final chapters are devoted to the planning for use and development of transportation.

Topics include economic justification, methods of financing, allocation of cost, traffic patterns, geometric design and location.

Brief Reviews . . .

ASCE, TRANSACTIONS, 1960 (SYMPOSIUM ON ROCKFILL DAMS)—Volume 125, Part II, 800 pages. The American Society of Civil Engineers, New York, N. Y. $6 to ASCE members and non-member participants in the symposium, $12 to non-members. Volume includes all ASCE literature on rockfill dams for the years 1954-1960 except two papers already in transactions.

NATIONAL WATER QUALITY NETWORK, ANNUAL COMPILATION OF DATA—Prepared by U. S. Public Health Service. 323 pages. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. $1.75. A compilation of uninterpreted data of major kinds of pollution in interstate waterways for the year ended Sept. 30, 1959.

SUMMARY OF RECENT GEOLOGICAL FINDINGS, Professional Papers 400-A and 400-B—By the Geological Survey. Chapter 400-A, 138 pages, $1; Chapter 400-B, 515 pages, $4.25. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Results are given of geologic investigations in all 50 states and many foreign areas, including Antarctica, and of geologic investigations of the moon.

PROGRESS CHART: U.S. NUCLEAR POWER PROJECTS—Atomic Industrial Forum, New York, N. Y. 22 x 29 in. $1. Chart lists 39 projects in operation, under construction, under pre-construction development, under contract negotiation or announced as of September 1, 1960. Gives ownership details, describes type reactor, fuel, capacity, etc.

ARTIFICIAL GROUND-WATER RECHARGE AT PEORIA, ILLINOIS—By Max Suter, State Water Survey, Illinois Department of Registration and Education, Urbana, Ill. Free. Report gives details of a pit method of artificial recharge for heavily used underground water supplies at Peoria. Research, types of recharge pits constructed, and operating techniques developed to maintain the water table in that area are discussed.

A PRIMER ON WATER—By L. B. Leopold and W. B. Langbein, U. S. Geological Survey. 50 pages. Superintendent of Documents, U. S. Government Printing Office. 35 cents. A lucid discussion of the hydrologic cycle is given in this paper-bound booklet. Water use and development are treated as they relate to the fluctuating water supply, city water systems, irrigation, farm ponds, flood control and water power.

TOPOGRAPHIC MAPS OF THE LOWER MISSISSIPPI RIVER AREA—Mississippi River Commission, P. O. Box 80, Vicksburg, Miss. 24 x 34 in. 50 cents per sheet. Part of a 28-sheet series, topographic maps are available for Little Rock, Ark.; Greenwood, Tupelo, West Point, Jackson and Meridian, Miss.; Port Arthur, Tex.; Breton Sound, Baton Rouge and New Orleans, La.

PENNSYLVANIA SANITATION GUIDE.—Pennsylvania Department of Health, P.O. Box 90, Harrisburg, Pa. Free. Special guide on procedures and standards for architects and engineers preparing environmental sanitation plans and specifications for approval by the Department.

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ALL NEW ROTA-SCREW

Portable air compressors

Gardner-Denver
engineers a proved principle into a totally new design in portable air compressors

Lowest maintenance ever!
No touching parts . . . *no* valves . . . *no* pistons . . . *no* blades to inspect or replace.

Instant compressed air!
Flip a switch to start; turn knob for immediate warm-up. Flip a switch to stop . . . *automatic blowdown.*

Pulsation-free air flow!
Continuous delivery of compressed air in a *new, efficient manner* . . . vibrationless operation.

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Saves fuel!
"THRIFTMETER"® control *matches engine speed* with air demand.

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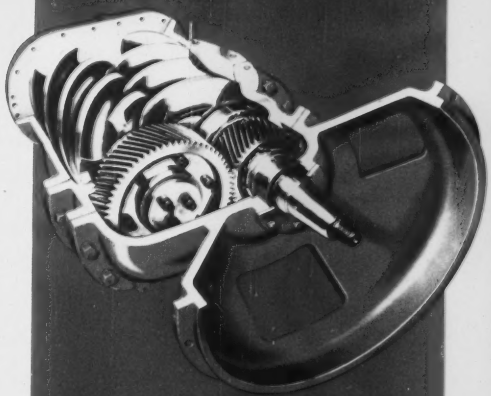
Tested for *40° below* to *115° above zero.*



THREE MODELS

SP900—capacity: 900 cfm.
SP600—capacity: 600 cfm.
SP125—capacity: 125 cfm.

See why the Rota-Screw is the compressor for you

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You get new economy...new efficiency... new durability with Gardner-Denver's new Rota-Screw compressors

The Rota-Screw operates without metal-to-metal contact in the compressor chamber. Rotors are separated by timing gears, held to precise clearances between rotors and casing by heavy-duty bearings. Absence of blades, pistons, valves and other reciprocating parts extends compressor life, reduces maintenance to a trifle. Costly, pesky, blade inspection or replacement completely eliminated.

Oil flooding of rotors seals air in, removes heat of compression. Single-stage compression eliminates start-up problems—and there are no complicated interstage air passages.

SPECIAL CATERPILLAR ENGINES—Rota-Screw compressors are driven by turbo-charged, 4-cycle, 1800 rpm engines. Caterpillar-designed especially for Gardner-Denver Models SP900 and SP600 rotary screw compressors.

SHOCK-ABSORBING COUPLING—no clutch—rubber block drive provides smooth power transmission between engine and compressor.

DE-AERATING RADIATOR—removes air from the water to supply a solid stream of water for cooling the compressor oil and the engine.

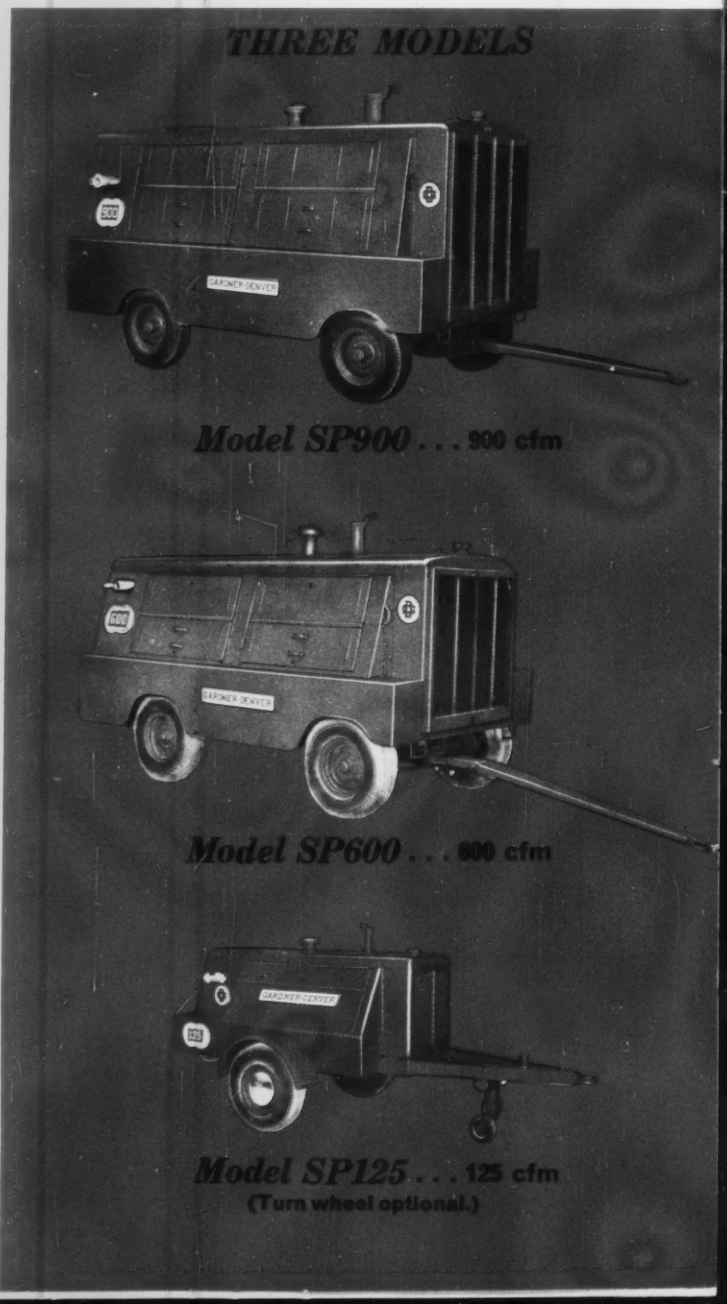
FAIL-SAFE, 24-VOLT ELECTRICAL SYSTEM—if fault occurs, unit will not start . . . will shut down if running.

EASY COLD-WEATHER STARTING—engine equipped with glow plugs and ether starting aid system.

IMPROVED RUNNING GEAR—extra-heavy running gear with automotive-type steering. Heavy-duty truck tires resist punishment of rough terrain.

DRY-ELEMENT-TYPE AIR FILTERS—shortens servicing time on filters.

ADDITIONAL IMPORTANT FEATURE—units are designed for accessibility . . . featuring *grip handles* and *step plates* for top service.



How Rota-Screw compresses air

A time-proved principle forms the basis for Gardner-Denver Rota-Screw compressors. As air enters the intake port, it is drawn into the space between lobes of two helical rotors. The revolving rotors force the air into succeedingly smaller interlobal spaces, thus compressing the air in a single stage until full compression is reached at the outlet port. As this air is expelled, the next groove comes into line with the outlet port to assure a smooth air flow without pulsation —cycle after cycle. Compressor operates without vibration . . . air tool performance improves.

Water-oil cooling system

Gardner-Denver's effective water-oil cooling system provides constant operating temperature for both engine and compressor under all climatic conditions from –40° to +115°. Discharge air temperature is normally kept between 170° F. and 190° F. with average operating conditions at 100 psi. Combined oil receiver and separator preserves oil supply, cleans air of oil.

SPECIFICATIONS

Model	SP900	SP600	SP125
Capacity at 100 psi	900 cfm	600 cfm	125 cfm
Engine	Caterpillar D343T	Caterpillar D333T	Continental F-266
Length	13′7″	12′1½″	12′1″
Width	6′8″	6′	5′4½″
Height	8′1½″	7′	5′5″
Track	5′8″	5′	4′8″
Turning radius	12′	8′	—
Net weight	13,775 lb.	9,150 lb.	2,980 lb.

For complete specifications, write for Bulletin SP-1.

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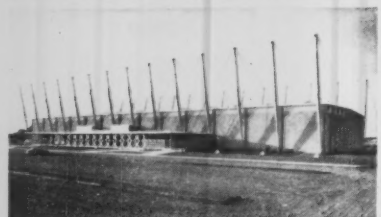
LITHO IN U. S. A.

Suspended Roof for New College Gymnasium

"Column-free on the inside" is the way the architect describes this exciting and wholly utilitarian structure. It is the Physical Education Building of the Central Washington College of Education, Ellensburg, Washington. It is 150 ft wide by 390 ft long and contains, among other things, a main gymnasium, upper gymnasium, field house, swimming pool, apparatus room, two four-wall handball courts, two classrooms, 14 offices and, locker rooms, dressing rooms, etc.

The suspended roof is actually floating, being slip-fastened to the exterior walls. There are twenty-eight 80-ft high prestressed concrete pylons. Each supports two pairs of 1-5/16 in. prestretched, galvanized bridge strands, which suspend the entire roof structure. The 56 cables, averaging 404 ft in length, were prestretched and accurately marked for all attachment points at Roebling's plant. This resulted in an easy, economical field erection procedure.



Spectacular new Health and Physical Education Building, Central Washington College of Education at Ellensburg, Washington.
Architect: Ralph Burkhard, A.I.A., Seattle
Structural Engineers: Anderson, Birkeland, Anderson, Tacoma
General Contractor: Earley Construction Company, Tacoma
Prestressed Concrete Fabricator: Concrete Technology Corp., Tacoma

Its 99,500 sq ft of floor space cost $14.15 per sq ft, including architect's fee and 4% sales tax, which is below average for a building of this size.

These basic details are indicative of the wide and varied benefits common to all suspended roof structures. Airline terminals and hangars, plants, gymnasiums, civic auditoriums – all are enjoying the free space afforded by suspended roofs.

Roebling's great experience with steel in tension leads naturally to its active role in the suspended roof field. Our findings, theories and interest in its every phase are offered to you at any time. Should you wish further details on this particular structure, or information of any nature dealing with suspended roofs, please do not hesitate to write Roebling's Bridge Division, Trenton 2, New Jersey.

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. . . Books

Reports and Pamphlets

DARDANELLE LOCK AND DAM, ARKANSAS RIVER, ARKANSAS; Hydraulic Model Investigation—Technical Report No. 2-558. U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 75¢

OUTLET WORKS, OAHE DAM, MISSOURI RIVER, SOUTH DAKOTA; Hydraulic Model Investigation—Technical Report No. 2-557. U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. $1.00.

PETROGRAPHIC AND ENGINEERING PROPERTIES OF LOESS—by H. J. Gibbs and W. Y. Holland. Office of the Assistant Commissioner and Chief Engineer, attention Code 841, Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colo. $1.00.

HYDRATED LIME IN ASPHALT PAVING—Bulletin 325. National Lime Association, Washington 5, D. C. Free.

PRINCIPLES OF ENGINEERING CALCULATIONS FOR LOESS SOILS DEFORMATION UNDER IRRIGATION INSTALLATIONS — Translated from Hydraulic Engineering and Reclamation, No. 8, 1958, Moscow. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. 50¢.

INDEX TO THE TEN-YEAR CIVILIAN POWER REACTOR PROGRAM — TID-8518 Series. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15¢.

ABSTRACTS OF SELECTED FOREIGN LITERATURE—TID-6613. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $2.50.

1960 EDITION OF FLOOD CONTROL AND NAVIGATION MAPS OF THE MISSISSIPPI RIVER—U. S. Army Engineer District, P. O. Box 60, Vicksburg, Miss., or U. S. Army Engineer District, St. Louis, Mo., Memphis, Tenn., and New Orleans, La. $2.25.

NUCLEAR REACTORS BUILT, BUILDING, OR PLANNED IN THE UNITED STATES AS OF DECEMBER 31, 1960—TID-8200. Office of Technical Information Extension, U. S. Atomic Energy Commission, P. O. Box 62, Oak Ridge, Tenn.

COMPREHENSIVE BIBLIOGRAPHY OF CEMENT AND CONCRETE 1925-1947—by Floyd O. Slate. Joint Highway Research Project, Purdue University, Lafayette, Indiana. $3.00.

CODE OF PRACTICE FOR THE DESIGN OF HYDRAULIC STRUCTURES — HYDRAULIC COMPUTATION OF WEIRS—USSR Ministry of Electric Power Stations, Directorate of Production Engineering in Building and Construction, 1952. Office of Technical Services of the U. S. Department of Commerce, Washington 25, D. C. $1.00.

SEEPAGE THROUGH FOUNDATIONS OF EARTH DAMS—Translated from Hydraulic Engineering and Reclamation, Vol. 11, No. 4, 1959, Moscow. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. 50¢.

SEEPAGE OF WATER FROM CANALS IN LOESS FORMATIONS AND SUBSIDENCE PHENOMENA IN IRRIGATED AREAS—Translated from Hydraulic Engineering and Reclamation, Vol. 8,

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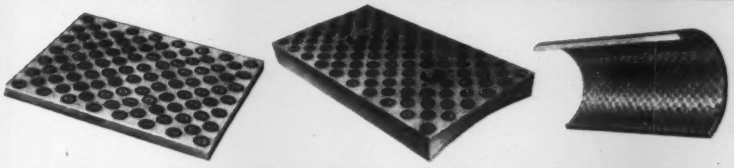
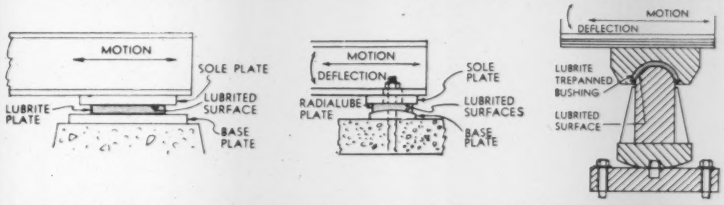


3 BASIC LUBRITE ASSEMBLIES FROM MANY AVAILABLE



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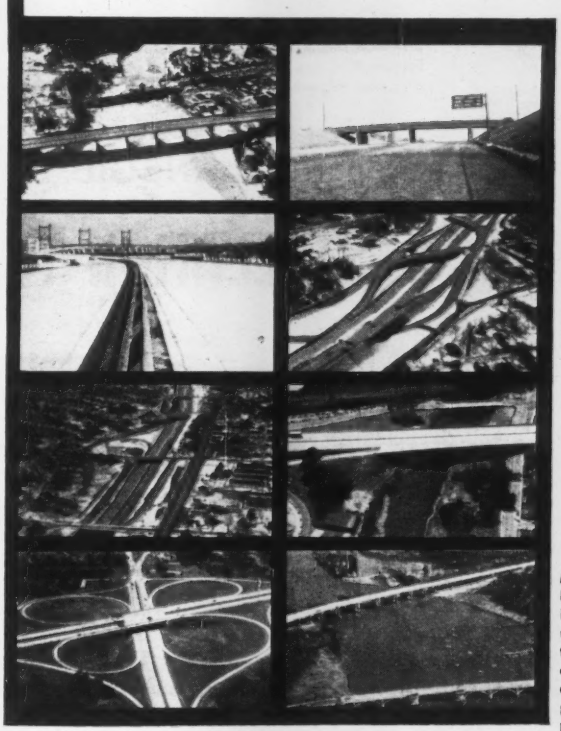

Manual No. 55 contains complete information, technical data and specifications about Lubrite Expansion Plates and Bushings for bridges, buildings, refineries, atomic energy and chemical processing equipment applications.

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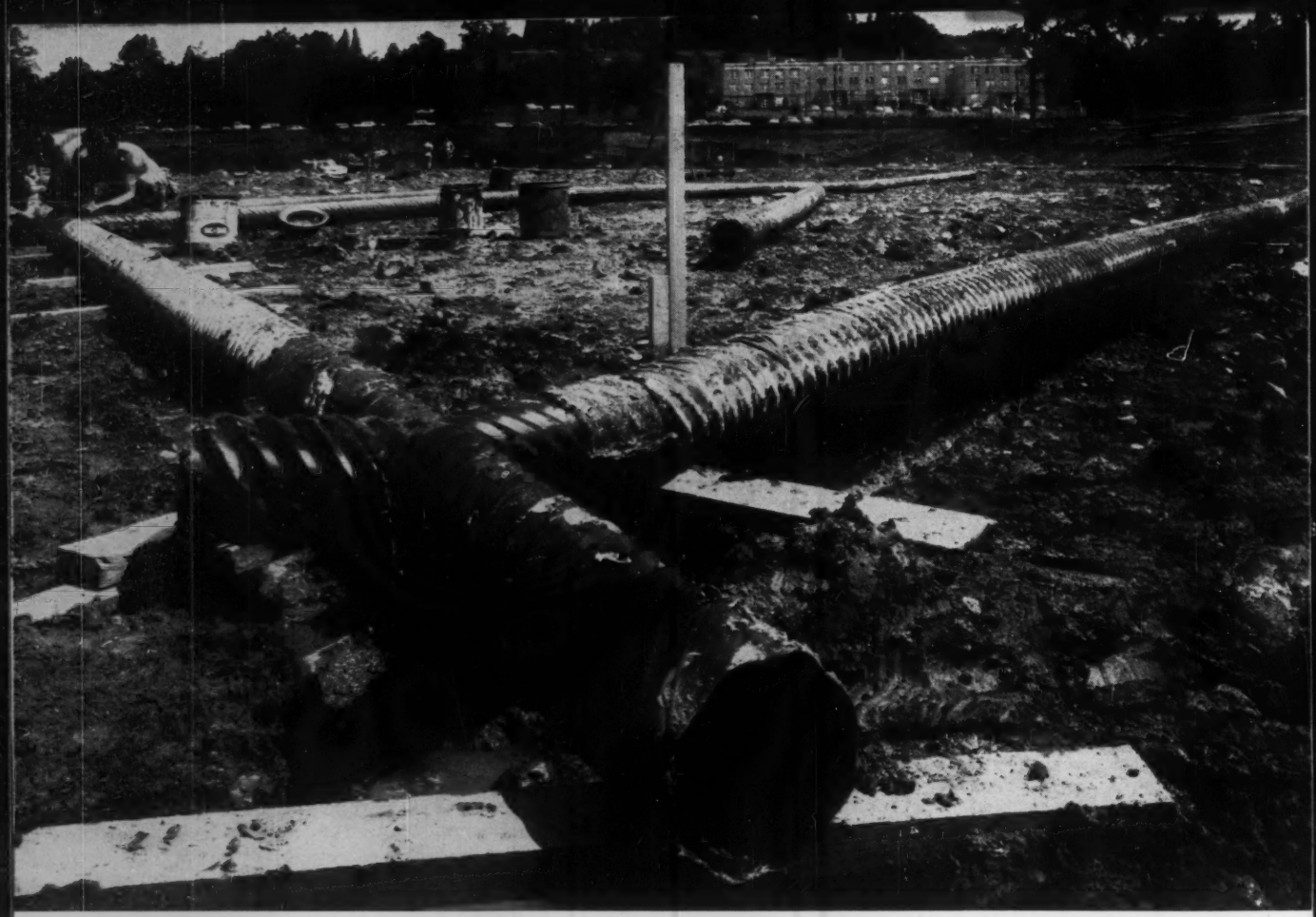


SIX-INCH LOK-COR for the Tech installation was laid out in a herringbone pattern with perforated laterals leading into non-perforated mains. LOK-COR's exclusive Double Lock Seam will not unravel or become disconnected, even under shifting loads, or severe freezing and thawing conditions.

LOK-COR Performance Report: **CARNEGIE TECH**

SUBDRAINAGE INSTALLATION TIME CUT 25%

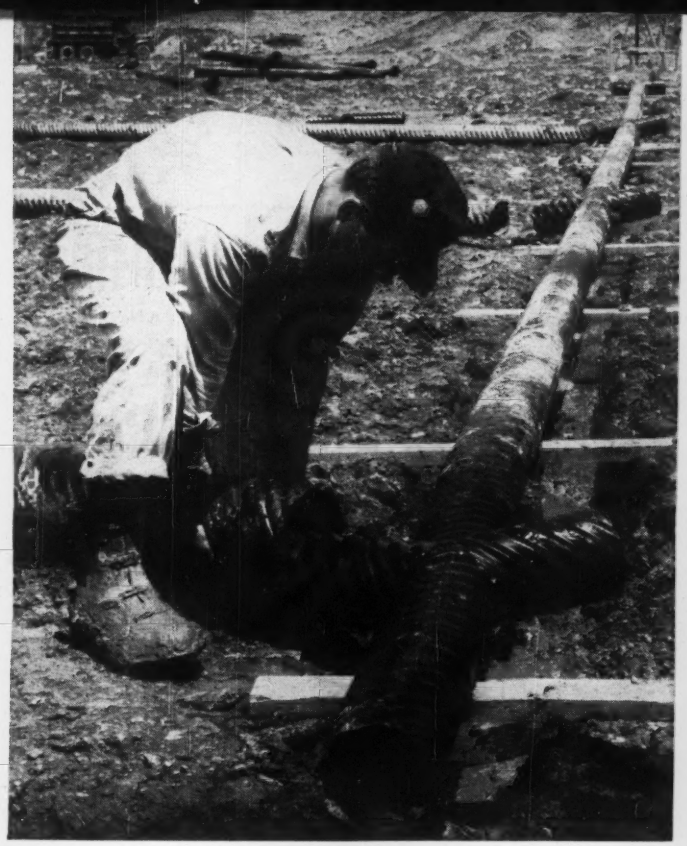
CARNEGIE INSTITUTE OF TECHNOLOGY—NOVEMBER, 1960. The speed and ease with which Republic LOK-COR Subdrainage Pipe can be installed, and LOK-COR's effectiveness for removing subsurface water were proved in Tech's new athletic field. The contractor advises that 25% was trimmed off time and labor costs with LOK-COR.

Site planner and landscape architect on the job was Griswold, Winters, and Swain, Pittsburgh. Mr. William Swain, partner in the firm, states, "*A six man crew put in approximately 800 feet of pipe a day . . . installed the complete subdrainage system in just eight working days. Fittings, clamps, and pipe were easily and rapidly joined.*"

"*I inspected the pipe upon delivery . . . found the coatings unusually uniform and sound. The 20′ lengths of LOK-COR made it easier to establish correct slopes as the pipe was installed.*"

FIELD WAS IN TOP PLAYING CONDITION just six weeks after sodding. The installation of Republic LOK-COR was completed August 15, 1960. Sodding was completed September 9th, and the first football game was played on October 22nd. Mr. Swain checked the field after each game and reports, "*Subdrains are functioning very well. Three games have been played on the new sod to date, with no more damage than is expected on established turf. One game was played during the end of a three day rain.*"

To better meet subdrainage requirements on your current and future projects, get complete information on Republic LOK-COR, the new standard in corrugated subdrainage pipe. Send the attached coupon or contact your nearest Republic Drainage Products Distributor.



ONE OF LOK-COR'S MANY TIME- AND MONEY-SAVING FEATURES is that LOK-COR can be installed in a much narrower trench than other types of subdrainage pipe, which require that connections be made in the excavation. At Carnegie Tech the complete LOK-COR subdrainage system was assembled on temporary supports at ground level, then lowered into trenches progressively as wooden supports were removed.

POSITIVE BOND AND ANCHORING, assure support for heavy weight. Truscon Re-Bars form backbones of steel in reinforcing modern highways, concrete slabs, footings, walls, beams, and columns. Truscon uses only new billet steel in Truscon Re-Bars to maintain highest quality standards. Fabricating facilities are located in major building areas to assure on-time deliveries. Shipments are bundled and tagged for quick on-the-job identification and placing.

QUICK, TROUBLE-FREE PERFORMANCE is yours when you use Republic Flexible Plastic Pipe to bring in construction water . . . or drain flooded excavations. Made of tough polyethylene, it resists abrasion and the effects of acids and alkalies. In addition, it is immune to electrolytic action. Lightweight and easy to cut or join, it can be used on job after job.

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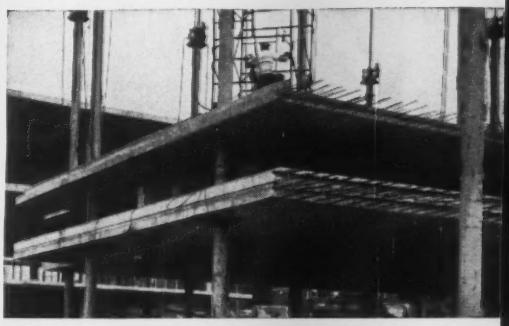

LIFT-SLAB CONSTRUCTION using columns of 10¾-inch O.D. Republic Steel Pipe, helped provide low-cost erection of this Cleveland, Ohio, building. Slabs were poured on ground, then gradually hoisted up the steel pipe columns by means of hydraulic screw jacks. Scaffolding and elevators were eliminated. Mail coupon for details on Republic Steel Pipe.

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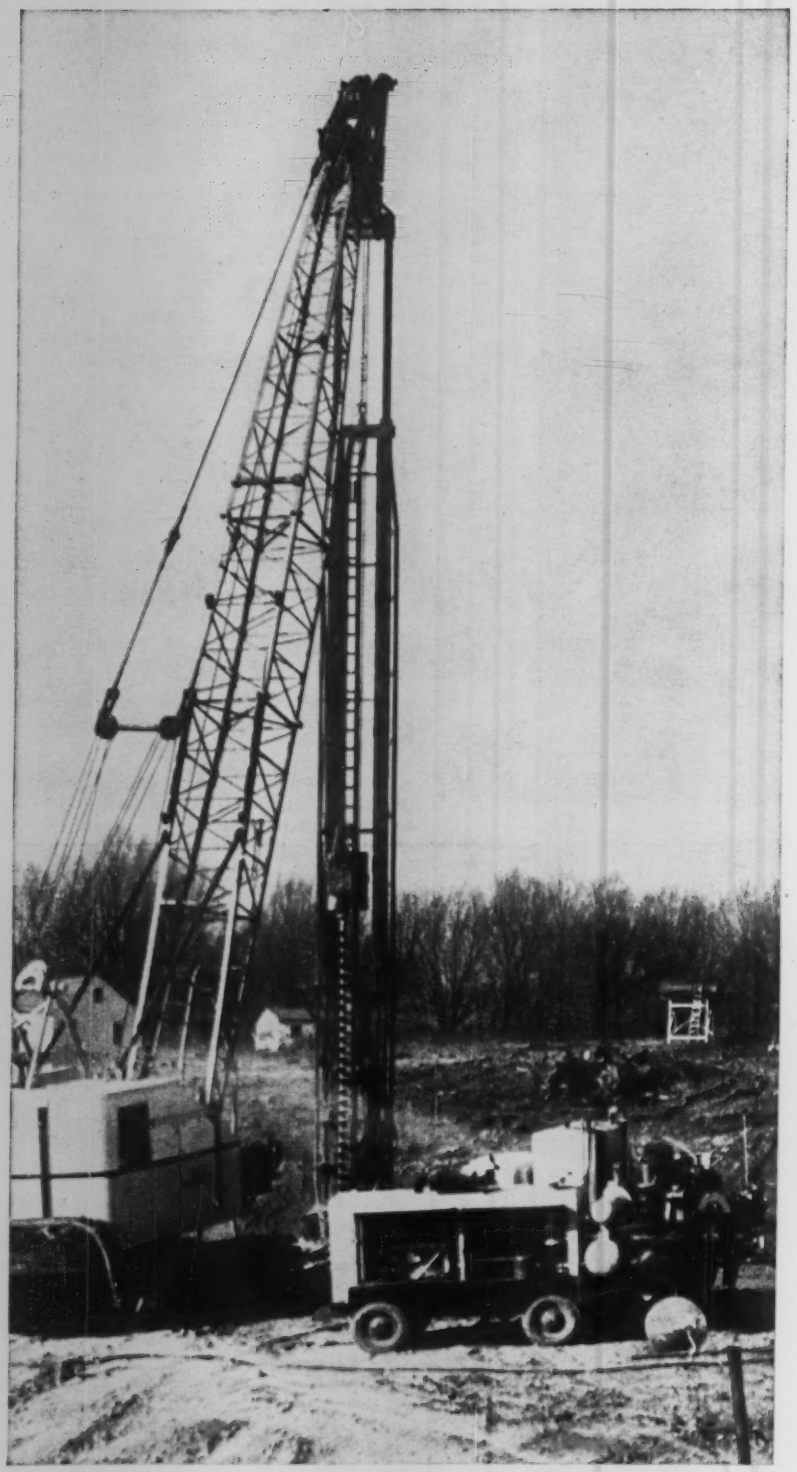

You can drill and drive with a Jaeger Roto

A Jaeger Rotary compressor is one of the most efficient and useful tools you can invest in.

On this interchange job, for example, a Jaeger "600" first powered the auger to drill pilot holes, then drove the piling with a waiting Vulcan #1 hammer — *as smooth as steam.*

LOW COST AIR, UNDER CLOSER CONTROL: Any big Jaeger Roto will deliver more than 500 cf of air per pound of fuel. This is because the efficient Jaeger produces full rated volume at 1700 rpm with the same engine others must operate at 1800 rpm.

Moreover, pressure is held constant, *even under the widely fluctuating demands of pile driving.* Speed modulation is smooth, stepless, and *instantaneously* controlled, over the entire operating range.

Ask your Jaeger distributor for the cost-saving figures on any size Jaeger Rotary — 75 to 900 cfm, or send for newest catalog JC-0.

FOR SMALLER HAMMERS TOO: Jaeger "250" Roto, a portable 2-wheel compressor, keeps McKiernan-Terry #5 hammer hitting 300 blows per minute for R. A. Wattson, contractor on Los Angeles County flood control project.

LEFT: "600" compressor powers air motor to auger pilot holes for beam piling, then drives piles with Vulcan #1 hammer. Job is controlled access divided highway with interchange on Interstate 240, near Memphis. S & W Construction Co.

THE JAEGER MACHINE CO., 200 Dublin Avenue, Columbus 16, Ohio

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Arbitration Award Not Upset

Arbitration decisions will not be set aside, as a general rule, because the complaining party thinks the award is unfair or because a court might have decided the matter differently.

The difficulty of upsetting arbitration decisions is illustrated by a recent Connecticut case that involved the following circumstances:

After a protracted period of negotiations, a contractor concluded a contract for construction of a house in Westport, Conn. The work was not completed within the stipulated time and the contractor later left the job, claiming that the delays were caused by the owner's interference and lack of cooperation. The contractor claimed that the work had been substantially completed.

Each party claimed damages for breach of contract. Pursuant to the terms of the contract, the dispute was submitted to arbitration. The arbitrators made an award in favor of the contractor. The contractor died during the course of the arbitration proceedings, and the executrix of his estate was substituted as a party.

The owner made an application to the court to set aside the award on the ground that the arbitrators showed evident partiality toward the contractor. The executrix of the contractor asked the court to affirm the award, which it did. The owner appealed, but the affirmation was affirmed by the appellate court.[1]

One of the complaints made by the owner was that the contract provided that the contractor would not be paid for extra work unless it was ordered in writing and that the arbitrators allowed the contractor payment for extra work even though no written order was given.

The court stated: "Even though the contract contained a firm price, the arbitrators were justified in making allowance to the contractor for extra work done. Provisions in a written contract requiring written orders for changes in the work or for extra work may be waived by the parties so that the owner becomes liable for changes or extras done by oral direction. Wexler Construction Co. v. Housing Authority, 144 Conn. 187, 193, 128 A. 2d 540. Here, the arbitrators specifically found that the requirement of written orders had been waived."

As to the owner's claim that the determination of the arbitrators was unfair, the court stated: "Every reasonable presumption and intendent will be made in favor of the award and of the arbitrators' acts and proceedings. Hence the burden rests on the party attacking the award to produce evidence sufficient to invalidate or avoid it. 6 C.J.S. Arbitration and Award, Section 130, page 281; Sturges, Commercial Arbitrations and Awards, page 549."

The court further stated: "Courts are in uniform agreement that mistakes by arbitrators sufficient to constitute a cause for vacating their award are not established by a mere showing that the complaining party, or even the court, would have decided the matter differently."

(1) Von Langendorff v. Riordan, 163 A. 2d 100, Supreme Court of Errors of Connecticut, July 19, 1960.

Contract May Curb Lien Rights

Contract provisions that waive the right to liens may be valid under state laws.

In an Illinois case, the subcontractors sued the owner and general contractor to foreclose mechanics' liens. The general contractor became bankrupt and his trustee in bankruptcy appeared in his behalf in the action. The action was dismissed on the ground that the prime contract contained a provision whereby the general contractor waived his rights and his subcontractors' rights to mechanics' liens on the premises of the owners and on any funds due and owing the general contractor from the owners for work performed pursuant to the contract. This judgment was affirmed on appeal,[1] despite the fact that the subcontractors had no knowledge of this provision of the contract.

Under Illinois statutes, such no-lien provision of a contract is valid when recorded where deeds are filed and indexed under the names of the owners and contractor.

It would seem advisable for subcontractors who are doing business in that state to check the records or determine if a no-lien provision exists in the general contract before entering into a subcontract.

(1) Ellman v. Ianni, 157 N. E. 2d 807, Appellate Court of Illinois, April 22, 1959.

Court Enforces Promise To Pay for Extra Costs

A promise to pay more than the contract price for work will be enforced under certain conditions.

A subcontractor on a government project brought an action against the prime contractor to recover a balance allegedly due under the contract.

Before signing the contract the subcontractor was given plans and specifications for the work to be done by the prime contractor and the subcontractor's estimate of the cost of performing the work was based on this information. Before the contract was entered into, substantial changes were made in the work to be performed by the subcontractor. The changes were not disclosed to the subcontractor at the time the subcontract was entered into.

When these changed conditions were discovered by the subcontractor, he refused to proceed with the work. The prime contractor then promised to pay him for the increased cost of the work resulting from such changes.

After the work had been performed, the prime contractor refused to pay for such increased cost and the subcontractor brought an action to recover the same and was granted a judgment which was affirmed on appeal.

(1) Nolan Bros. Inc. v. United States, 266 F. 2d 143, U.S. Court of Appeals, March 18, 1959.

Engineers in Damage Suit By Third Party Complaint

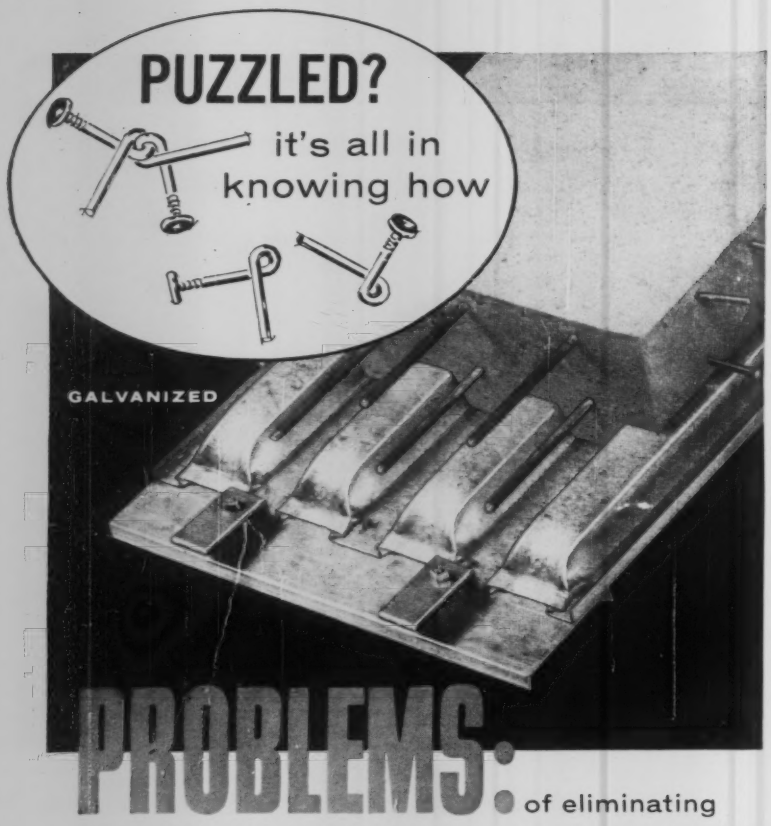
The liability for damages caused by negligence may be ultimately assessed in a single action against a third party guilty of the negligence although the primary action for damages is against the contractor and another party.

How the law handles this is illustrated by an Illinois case in which a firm of consulting engineers had been employed to design and supervise construction of a sewer.

One of the engineers' employees sued the Illinois Power Co. and the contractor engaged in the sewer construction work to recover damages for injuries received as a result of an explosion of a gas main.

The gas company filed a third part complaint against the consulting engineers.

An application was made to dismiss the third party complaint. This appli-



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cation was granted by the lower court but was reversed by the appellate court.[1]

The third party complaint filed by the gas company against the consulting engineers charged that the engineers were employed to design improvements and were given supervision of the construction of the sewer. It claimed the engineers breached their duty to use due care and caution to avoid damaging a gas main and that, as a result, an employee of the engineers was injured. The complaint was sufficient, the court said, to state a cause of action by the gas company for indemnity in the amount that it might be held liable in the action brought against it by the engineers' employee.

(1) William Dolezal v. Illinois Power Company et al., 167 N.E. 2d 25, Appellate Court of Illinois, May 18, 1960.

Rescinding of Contract Is Found Justified

A party to a contract has a right to rescind the contract where the other party to the contract manifests doubt as to his willingness or ability to perform.

The rule was applied by a federal court in Rhode Island in a case involving a subcontract for structural steel erection on a highway job.

The sub refused to perform the work after learning that the general intended not to perform its obligations under the contract.

Later, the general contracted for the work with another party at a price in excess of the original contract. He sued the first subcontractor for the extra cost, basing his claim on a breach of contract.

The court[1] found as a fact that the general had expressed its unwillingness to perform its obligations substantially as stipulated in the contract and that, under such circumstances, the contract could be rescinded and no breach of contract resulted.

(1) J. K. Welding Co., Inc. v. W. J. Halloran Steel Erection Co., 178 F. Supp. 584, U.S. District Court of Rhode Island, October 27, 1959.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts*; *Legal Guide for Contractors, Architects and Engineers*; and *Legal Cases for Contractors, Architects and Engineers.*

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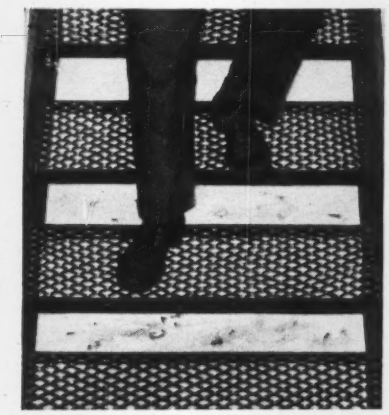

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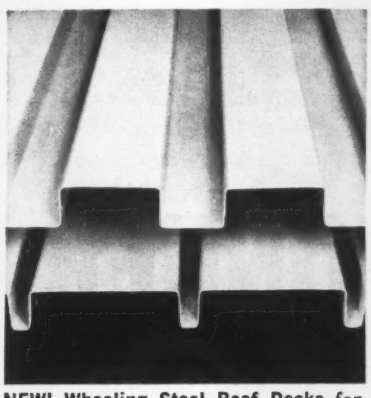

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Kennecott Copper Shares Utah Highway Bill

With most of this three and a half mile highway, U.S. Alternate 50, in the area of the Kennecott Copper Co.'s tailings pond, the job location presents some sizable construction complications for both contractor and copper company.

Gibbons & Reed Co., Salt Lake City, took this highway contract for $1,302,530, which was just 4% under the second low bid that was submitted by W. W. Clyde & Co., Springville, Utah. Edward J. Watson, Salt Lake City, is the engineer on this job for the Utah State Department of Highways.

Because of the construction of the highway, Kennecott must build three overhead tailings flumes across the roadway at the Magna and Arthur refineries. The contractor cannot interrupt the refining process in any way during construction, and must complete two miles of dyke and haul road for the Copper company before getting to the major section of the highway. A permanent haul road grade separation structure will be provided as part of the project to eliminate the hazard of trucks and equipment hauling some 400,000 cu yd of dyking material a year over the new highway at grade. The Copper company performs an almost continuous dyking operation because the tailings pond rises two an a half to three feet a year. The pond covers about 10 sq miles. Half of the cost of the grade separation will be paid by the state of Utah, Kennecott Copper Corp. pays the other half.

The highway through the Copper company's area will be four lanes wide divided by a 16-ft raised median and with a left turn storage lane that will be used for the heavy traffic during shift changes.

About one million cu yd of borrow from the area previously occupied by the abandoned city of Garfield will be used on the roadway. An additional 797,600 cu yd, the largest single contract item and 15% of the total cost, will be imported at $0.20 a unit. Prices for imported borrow ranged upward from Gibbons & Reed's low to $0.32 a cu yd.

Included in the roadway section is a three-span steel beam structure, a prestressed concrete beam structure, and a concrete rigid frame structure. The entire roadway will receive a plant-mix bituminous surface, accounting for 8% of the contract cost. Prices ranged from $2.50 to $3.30 a ton.

Wages include: common labor, $2.275/hr; carpenter, $3.30; reinforcing and structural ironworkers, $3.575; shovel operator, $4.18.

The bidding included:

1C	Gibbons & Reed Co., Salt Lake City, Utah	$1,302,530
2	W. W. Clyde & Co., Springville, Utah	1,350,910
9	Peter Kiewit Sons' Co., Idaho Falls, Id.	1,774,871
EE	Edward J. Watson, Salt Lake City, Utah	1,392,447

Bids: 1-10-61 Items	Unit	Quantity	Unit Prices 1C	2
Bit surface, plant mix, tp A	t	41,650	2.60	2.40
mat tp 120-150 pen	t	2,300	30.25	29.15
tp MC-1 or MC-2	t	435	34.00	33.00
tp RC-1 or RC-2	t	165	36.70	35.00
Cover mat tp B	t	435	8.34	7.00
Gravel surface tp B	t	41,000	1.10	0.70
base crs	t	58,600	0.90	0.69
Exc, uncl, roadway	cy	190,800	0.22	0.49
Overhaul, cl A	stay	8,620,400	0.01	0.01
cl B	ymi	972,900	0.10	0.08
Borrow, imported	cy	797,600	0.20	0.27
Compaction	cy	985,000	0.026	0.05
Rolling, pneumatic tired or power roller	hr	310	10.00	9.00
Watering	Mgal	22,964	1.24	0.75
GIP 8"	lf	30	3.50	7.00
RCP 12"	lf	562	2.85	3.00
18"	lf	66	4.40	4.70
24"	lf	764	7.00	6.70
30"	lf	226	9.75	9.30
36"	lf	64	13.30	12.60
60"	lf	160	32.20	29.00
End section, reinf conc, 18"	ea	1	75.00	56.00
24"	ea	10	110.00	78.00
30"	ea	8	150.00	110.00
36"	ea	2	200.00	150.00
CMP 12"	lf	252	6.00	3.30
End section, met, for CMP, 12"	ea	12	27.65	27.00
Pipe, pressure, cl 150, asb cmt, furn 12"	lf	4,236	4.45	4.30
RCP, pressure, rubber gasket, 50' head				
21"	lf	1,170	7.50	7.45
24"	lf	2,850	8.61	8.90
Pipe, conc, relaying, 24"	lf	46	3.25	3.00
30"	lf	173	3.59	3.00
36"	lf	40	4.34	4.00
60"	lf	74	7.00	5.00
transit, salvage, 12"	lf	4,236	0.33	0.60
conc, salvage, 21"	lf	1,170	0.95	1.80
24"	lf	2,850	1.10	1.90
CMP, salvage, 24"	lf	40	1.10	2.00
Conc, AE, cl A	cy	430	51.00	67.00
Steel, reinf	lb	71,860	0.15	0.12
str	lb	4,760	0.25	0.25
Exc, for uncl str	cy	3,617	1.60	1.75
Tamping, mechanical	hr	690	7.55	8.00
Conc curb tp 1-E	lf	33,590	1.30	1.25
Rail, deep beam hwy guard, CNC posts	lf	19,800	2.76	2.80
Posts, guide	ea	110	9.20	7.00
Exc, small ditch	cy	15,400	1.00	1.00
Riprap, hand placed	cy	16	20.00	20.00
Trees, removal	ea	109	14.00	25.00
Markers, ROW	ea	86	5.50	8.00
Flagging	hr	5,200	3.22	3.10
Pilot car operation	hr	20	5.00	7.00
Markers	ea	2	25.00	35.00
Water equip, furn	ls	job	5,000	11,000
Signs, construction, furn	ls	job	1,000	2,000
Conc beam str, prestressed				
Exc, for uncl str	cy	550	3.90	2.50
Conc, AE, cl A	cy	709	67.15	59.00
Steel, reinf	lb	153,420	0.125	0.114
Handrail, met	lf	611	4.50	4.25
Conc, prestressed members, specialty item,				
36"x45'5 3/16"	ea	12	743.00	712.00
36"x43'5 1/8"	ea	24	722.00	695.00
Steel beam str, 3-span				
Exc, for uncl str	cy	441	3.42	3.00
Conc, AE, cl A	cy	1,158	53.40	53.00
Steel, reinf	lb	207,308	0.125	0.114
str, specialty item	lb	412,325	0.22	0.177
Handrail, met	lf	484	4.50	4.25
Conc, rigid frame str				
Exc, for uncl str	cy	272	1.85	2.00
Conc, AE, cl A	cy	290	43.00	52.00
Steel, reinf	lb	36,873	0.125	0.114

Completion time: 250 working days
Liquidated damages: $200 per working day

ENR Building Cost Index (1913 = 100) 20-cities average — 562.91

ENR Construction Cost Index (1913 = 100) 20-cities average — 834.32

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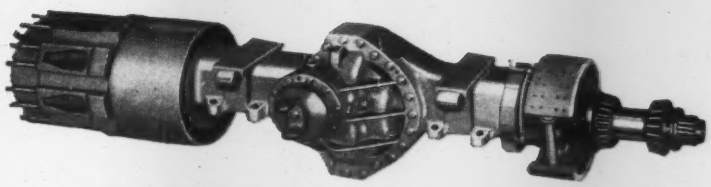
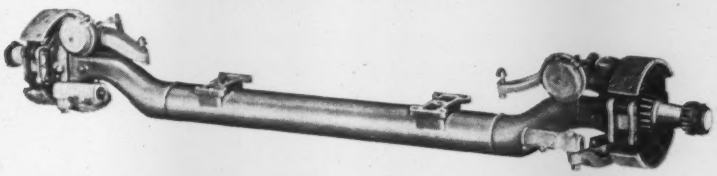
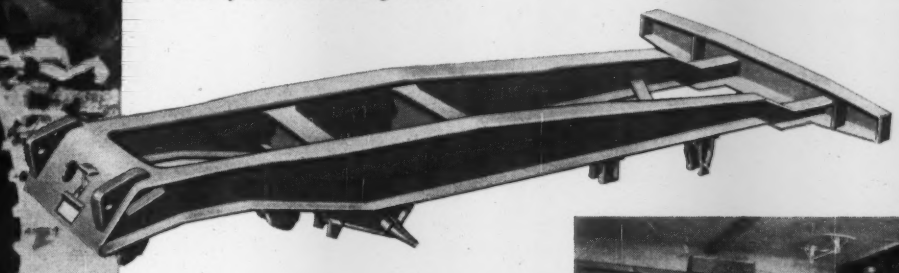


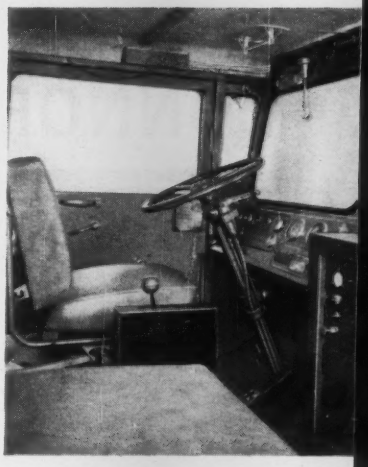
Heaviest-duty Mack rear axle, combining hypoid carrier with Planidrive®, keeps M-30X hustling where others bog down. The new M-30X boasts one of the strongest, longest-lived rear axles of any four-wheel dumper in the field. Drive is through exclusive single-reduction hypoid Mack carrier, with planetary gears in wheel hubs. Suspension is by extra long, extra broad semi-elliptic progressive-rate leaf springs with cam-faced slipper ends and radius rods.



New tubular front axle withstands heavier loadings. Steel tubing, seven inches in diameter, with walls ¾" thick is welded to cast ends to provide a reversed Elliott front axle that withstands the most punishing loads of quarrying, construction or mining. Extra wide tread gives maximum stability and short turning radius.



Five-crossmember, alloy steel frame shrugs off jarring drop loads of big shovels. Typical of Mack off-highway truck construction practices, the frame of the M-30X Model is extra solid, extra strong. I-beam main rails are tied together by five welded crossmembers to prevent stress concentrations.



New, massive functional cab for easier truck handling . . . extra driver comfort. The M-30X cab is not only rugged, but completely functional. Offset design provides maximum vision for quicker spotting and dumping and safer operation. Forward position permits heavier loading of new set-back front axle.

Meet the new Mack four-wheel dumper chassis that meets the most challenging, rigorous, heavy-duty jobs in mining, quarrying and construction—the M Model 30-Ton Dumper.

Visually, the silhouette of the new M-30X exhibits efficient, modern lines that are unmistakably Mack from the new, spacious and functional cab to a rear axle that is one of the sturdiest and most trouble-free of any four-wheel dumper in the field.

Beneath visual ruggedness lie the time-proved features that have won Mack construction trucks worldwide fame for complete reliability and performance. In addition, there are many M Model exclusives that make it even more maneuverable, rugged, dependable and safe.

Sure to be first choice among those who must haul huge tonnages profitably, the M Model is ready for your most critical appraisal. See your Mack branch or distributor for the full story of its capabilities. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

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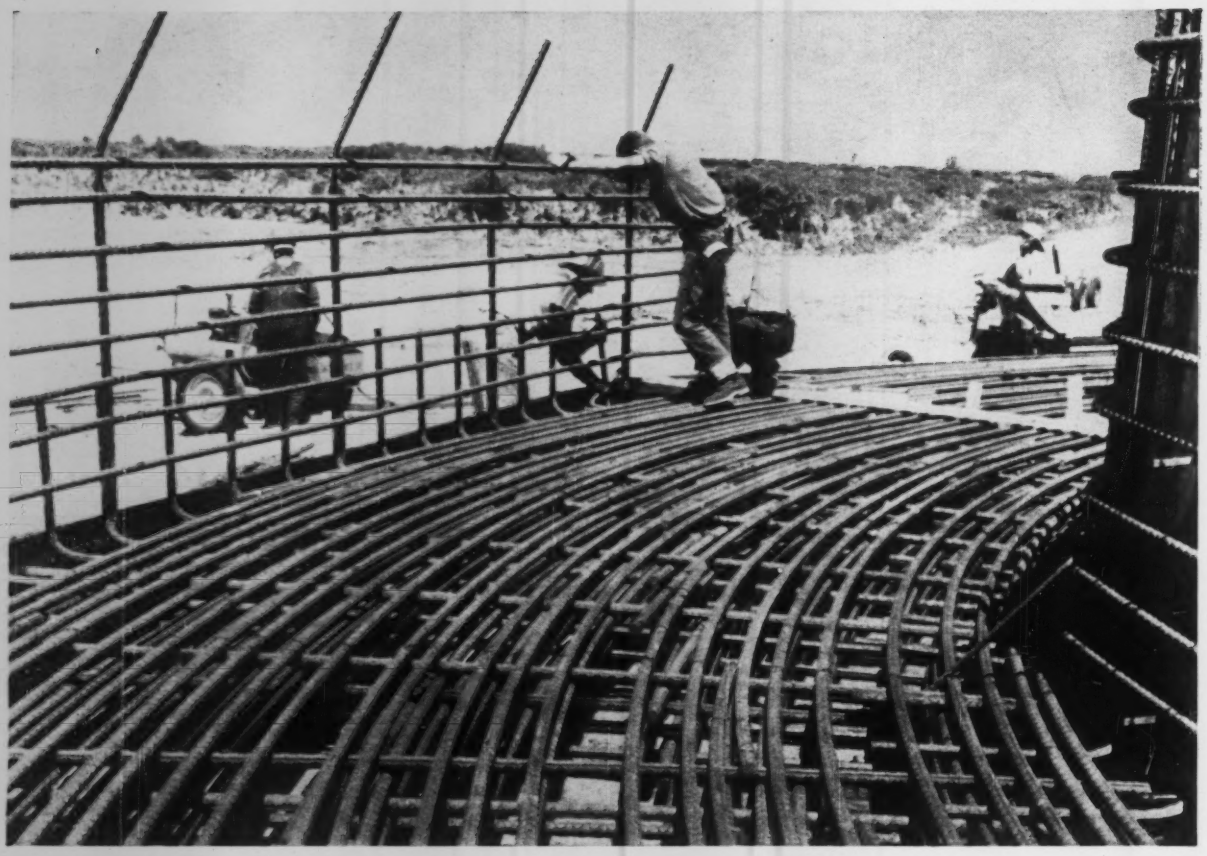

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Materials Prices

Monthly Market Quotations By ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Mar. 23; Next, Apr. 20.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Apr. 6; Next, Apr. 27.
- Wage Rates, Building Board, Lath, Insulation: Last, Mar. 30; Next, Apr. 27.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, Apr. 6; Next, May 4.

Iron and Steel Products–F. O. B. Warehouse, Per 100 lbs., Base Price

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles##	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
Struct. shapes	Cwt	$ 801–8.36EsV	$9.70	$9.00ty	$8.21–9.31KzsV	$7.07–8.34ysV	$7.64–8.91styV	$7.46–8.73tysV	$7.71–9.49MsV	$8.24cK	$7.64–8.91MsV	$9.90sT	$8.70–10.45ktsV	$7.78–8.17ysV	.....	$8.02–8.84Vzs	$7.35–8.40zsV	$7.07–8.34syV	$7.30–8.57stxyV	$9.40–11.25zsV	$8.60–10.80aDsV	$7.90–8.60CF/8.20–8.90AjF	$9.20H
Reinf. bars, new steel	"	8.50	9.00T	8.51–9.94tyV	8.75t	6.80–6.90guV	8.16t#	6.70ct	9.00	9.35	7.37	8.21N	7.35frt	9.26T	$8.00gktz	8.60ty	8.43uy	7.35y	7.35#txQ	9.85jS	8.85DM	7.00/7.50FGi	7.50
Reinf. bars, rail steel	"	.....	.....	8.51–9.94tyV	8.75t	6.80–6.90guV	.....	.....	9.00	.....	11.85	.....	.....	9.26T	.....	8.60y	9.30y	.....	7.35#txyQ	.....	.....	7.00/7.50FGi	7.50
Expanded metal lath & std. diamond mesh, 3.4 lb	"	43.50	44.50	61.00pK	47.00K	52.00#U	44.50Kg	42.50KL	44.00u	51.17n	67.00 O	51.00	55.00S	44.50K	63.00K	50.00n	45.50#U	58.50#rw	64.00wxK	53.00S	67.00#nD	65.700h	49.50qI
std. ribbed, 3.4 lb	"	48.00S	49.00	67.00pK	51.00K	63.00#U	48.50mnKg	46.50KL	48.50w	56.35n	74.00 O	55.50	64.00S	49.00K	69.00K	58.00no	50.00#U	64.50#rw	65.00wxK	58.00S	73.50#nD	70.20h	44.85qI

Reinforcing Bar Extras, per cwt, N. Y.—• Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000–1999# +$1.50; 2000–4999#, +$1.20; 5000–9999#, +90¢; 10,000–19,999#, +60¢; 20,000–29,999#, +30¢; 30,000–39,999#, +10¢; 40,000# & up, none. • Size†: #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #7, #8, #9, #10, #11 +50¢ • Bending: heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). • Engineering (details and placing from designs by others); over 500 tons, +45¢; 200–499 tons, +50¢ but not over $4500; 75–199 tons, +65¢ but not over $2000; 20–74 tons, +75¢ but not over $975; 5–19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

Structural Shape Extras, per cwt, Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, St. Louis and Pittsburgh. Item; 10,000# and over, base, 5,000–9,999#, +10¢, 2,000–4,999#, +35¢, 1,000–1,999#, +85¢, 400–999#, +$1.75, 100–399#, +$1.75, under 100#, +$1.75. Order: 20,000# and over, base, 10,000–19,999, +25¢, 5,000–9,999, +65¢ 2,000–4,999, +$1.50, 1,000–1,999, +$2.50, 400–999, +$4.00, under 400, +$8.00. Item extras do not apply in Chicago, Cleveland, Cincinnati, Detroit and St. Louis. •# Delivered. •* Aver. of Canadian & American. •## add 4% sales tax. •a 2000–4999#. •b 10,000–19,999#, fob city. •c 20 tons or over. •d 10,000–29,999#. •e Intermediate struct'l. •f incl. delivery in free zone. •g CL. •h list price; dominion tax exempt; add provincial and municipal taxes. •i add provincial and municipal sales taxes. •j intermediate and hard grade. •k fob city. •l delivered; contractor to do unloading. •m copper alloy. •n LCL. •o asphalt coated. •p 500 sq yd. or more. •q 2.5 lb. •r less 2% disc. for cash. •s 10,000# item in 20,000# order. •t less ½% disc. 10 days. •u add 10¢ switch. •v incl 15¢ del. •w truck lots. •x add 2% sales tax. •y add 15¢ del. •z add 10¢ del. •A American made. •C Canadian made. •D ½% for cash. •E 30,000# or over. •F Federal tax exempt for bldgs. •G add 10¢ del. •H $8.85 without tariff charges. •I 3 lb $60.00. •J 4 lb $47.50. •K less 2% disc. 10 days. •L F.o.b. Youngstown plant. •M 5,900–9,999#. •N 2,000–19,999#. •O 100 sy lots. •Q 5 tons to CL. •R revised. •S less 2% disc. 10th. •T less ½% disc 10th of mo. •U less 2% disc. 10 days. •V varies according to type and size.

Iron and Steel Products–Base Mill Prices Carlot Quantities

Item	Unit	Birmingham area	Chicago area	Pittsburgh	Buffalo area	Cleveland	Youngstown area	Geneva	Los Angeles	Pueblo
Struct. Shapes	cwt	$5.50	$5.50	$5.50	$5.50	.....	.....	$5.50	$6.20	.....
Plate Carbon Steel	"	5.30	5.30	5.30	5.30	.....	.....	5.30	.....	.....
Reinf. Bars (billet)*	"	5.675	5.675	5.675	5.675	$5.675	$5.675	.....	6.375	.....
Rivets, ½" struct	"	12.25	12.25	12.25	12.25	.....	.....	.....	.....	.....
Sheet Piling (base)	"	.....	6.50	6.50	6.50	6.50	.....	.....	6.50	.....
Steel Rails, standard	Ton	110.50	110.50	110.50	110.50	.....	.....	.....	.....	.....
light	"	130.00	130.00	130.00	130.00	.....	.....	.....	.....	.....
Track Supplies										
Angle bars	cwt	6.975	6.975	6.975	6.975	.....	.....	.....	.....	$6.975
Std. spikes	"	9.75	9.75	9.75	9.75	.....	9.75	.....	9.75	9.75
Tie plates	"	6.60	6.60	6.60	6.60	.....	.....	.....	6.875	6.60
Track bolts	"	.....	.....	14.75	14.75	14.75	.....	.....	.....	.....

* Fairless Works, $5.825 Revised.

***WROUGHT STEEL PIPE** (Full standard weight) Discount from list; see footnote

Mill	2½ & 3 in.,* Black %	2½ & 3 in.,* Galv. %	3½ to 6 in.,* Black %	3½ to 6 in.,* Galv. %
Lorain, Ohio	13.75	+3.50	+1.75f	+19.50f
Aliquippa, Pa.	13.75	+3.50	3.25a	+14.50a
Sparrows Pt., Md.	17.25	+List	.....	.....
Benwood, W. Va.	13.75	+3.50	.....	.....
Youngstown, O.	13.75	+3.50	3.25	+14.50a
Indiana Harbor, Ind.	12.75	+4.50	2.25ab	+15.50a
Sharon, Pa.	13.75	+2.50	3.25ab	+13.50ab
Wheatland, Pa.	13.75	+3.50	3.25a	+14.50a
Etna, Pa.	13.75	+3.50	.50de	.....
Fontana, Calif.	0.75	+16.50b	+9.75ab	+27.50ab

* Threaded and coupled: a 3½ to 4 in. b to 1, 5 and 6 in. c 6 in. d Seamless 5 in.

WROUGHT STEEL PIPE, butt or continuous weld: Deduct (+) or add (—) these "discounts" from or to the following carlot list prices to get mill prices. Price per ft. (based on approx. $200 per net ton): 2½ in., 58½¢; 3 in., 78½¢; 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight for destination price.

WROUGHT IRON PIPE, lap weld: List prices per ft. same as for wrought steel pipe, but add these "discounts" to get Pittsburgh mill price. 2½ to 3 in., black 106%; galv. 139%; 4 to 6 in., black 103%; galv. 133%. Add freight for destination price.

WELDED FABRIC REINFORCING, FOB Joliet, Ill., Donora, Pa., Monessen, Pa. mill, per 100 sq. ft.: 4 x 13 in., No. 5 & 10 wires....$7.04; 4 x 12 in., No. 8 & 12 wires....$2.62; 6 x 8 in., No. 6 & 6 wires....$4.17

Plumbing, Heating, Water, Sewer Pipe and Tubing

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles##	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
C. I. Pipe Price Index	a	130.6	140.2	125.8	143.2	140.0	135.6	141.8	137.9	145.1	142.1	138.5	148.6	145.0	132.3	138.6	137.8	142.9	135.7	148.6	149.0	.....	.....
Asbest. Cem. Pipe, 6" V	lin. ft.	$1.52	$1.61	$1.52	$1.63	$1.48	$1.63	$1.63	$1.63	$1.71	$1.63	$1.63	$1.67	$1.53	$1.61	$1.63	$1.61	$1.63	$1.48	$1.67	$1.71	.....	.....
6" transite pipe V	" "	1.69	1.69	1.69	1.71	1.69	1.71	1.71	1.71	1.80	1.71	1.71	1.79	1.75	1.69	1.71	1.69	1.71	1.69	1.79	1.80	.....	.....
Asbest. Cem. Pipe, 12" W	" "	2.36	2.19	2.26	2.19	2.19	2.19	2.19	2.26	2.36	2.19	2.26	2.19	2.26	2.26	2.26	2.19	2.19	2.26	2.19	2.19	.....	.....
12" transite pipe W	" "	2.48	2.30	2.37	2.30	2.30	2.30	2.30	2.37	2.48	2.30	2.37	2.30	2.37	2.37	2.37	2.30	2.30	2.30	2.37	2.30	.....	.....
Clay Sewer Pipe																							
8 in. ASTMC 13-55	ft.#	0.58r	0.665	0.50r	0.84qrtL	0.93rm	0.59	0.66BCN	0.575#B	0.56nr	0.97nk	0.62r	0.82bl	1.05oB	0.566r	0.94	0.75	0.94K	0.62r	0.86#d	0.88bk	1.13u	0.76F
12 in. " "	"	1.14r	1.20	0.95r	1.55qrtL	1.78rm	1.14	1.27tBC	1.09#B	1.00nr	1.86nk	1.125r	1.78blS	1.90oB	1.078r	1.76	1.44#	2.01K	1.23r	1.86#d	1.86kb	2.00u	1.43F
24 in. ASTMC 200-55T	"	4.88r	3.05	4.14rw	6.39qrtM	7.52rm	4.95	8.47tBC	4.75#B	4.98r	7.48nk	6.324br	7.19blS	8.00oB	5.65r	12.89	9.40#v	8.79K	5.10r	7.53#d	7.61k	7.00u	5.70F
36 in. " "	"	12.00r	12.71	13.50rw	.....	21.16rm	14.35	23.45tBC	10.53#bB	.....	19.95nk	16.86r	16.90blS	.....	.....	35.61	25.57#v	24.15K	12.95rS	18.00#d	.....	13.50u	.....
Clay Drain Tile 6 in. V	M ft.	200.00sr	187.80	295.00rx	244.00r	220.00Br	177.50	179.40mBC	.....	460.00nr	212.00mk	315.00r	410.00lS	.....	240.50pr	240.81	230.00#	190.00	200.00r	360.00#l	260.00ck	288.00	175.00F
8 in. V	M ft.	.....	289.20	430.00rx	348.50r	330.00Br	274.60	276.60mBC	.....	640.00nr	327.00mk	625.00r	590.00lS	.....	566.00	369.84	350.00#	295.00	350.00r	620.00#l	.....	545.00	290.00F
Concrete Sewer Pipe, 12"	ft.#U	0.95mKr	1.01	1.75rS	1.56S	1.30	0.85rA	1.35	1.27BD	1.05m	1.40k	1.70r	1.30vE	2.19DFH	1.41iR	1.50#B	1.50#h	1.66DB	1.75i	1.05#Q	1.90ky	1.17D	1.27F
24 in.	ft.#U	3.75mKr	2.75	2.75rS	3.60S	4.00	3.25rA	2.40P	2.95BD	3.50m	5.23k	4.25r	3.85fvE	6.31DFH	3.76il	3.60#B	5.50#h	3.93DB	4.05	3.30#Q	4.50ky	3.11jpD	5.19F
Copper Water Tubing																							
3/8", Type L	ft.	0.1480	.....	0.1700	0.1480	0.1480	0.1680	0.1480	.....	0.1680	0.1588	0.1310	0.1480	0.1680	0.1680	0.1480	0.1510	.....	0.1480	0.1723	0.1480	0.2089U	0.3259UV
1/2", Type L	"	0.1670	.....	0.1900	0.1670	0.1670	0.1900	0.1670	.....	0.1900	0.2210	0.1480	0.1670	0.1900	0.1900	0.1670	0.1700	.....	0.1670	0.2418	0.1670	0.2450U	0.3643UV

•† Extra quality. •‡ delivered. •# add 4% sales tax. •a PRICE INDEXES or CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S. PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. •b Extra strength. •c 4-in., $130. •d SS361-A. •f 21 in. •g culvert pipe; reinf., ASTM C 75–56. •h reinf., ASTM C 75–54. •i reinf., ASTM C 76–55. •j centrispun. •k less 2% disc. for cash. •l fob plant. •m truck del. •n LCL del., fob truck. •p less 5% disc. 10th. •p freight allowed to destination in city. •u 35,000# minimum. •r less 2% disc. 10 days. •s 1 ft lengths. •u CSA A 60. •v standard strength. •w SS; add 20% for d.s. •x fob city. •y Reinforced. •z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. •A single strength. •B truckload. •C less 2% disc. 15th. •D ASTM 76–57. •E less 1% disc. 10 days. •F less 2% disc. 30 days. •G LCL. •H CL. •I fob origin, freight allowed. •J reinf. B14–15. •K Less 2% disc. 15 days. •L ASTM 13–57. •M ASTM 200–57. •N 2 ft lengths. Trucklots. •O add 2% Sales Tax. •P 18 in. •Q less 1% disc. 10th. •R revised. •S ASTMC 72, 12" 1.55, 24" 4.00. •T Second price transite pipe. •U Type K. •V including 11% sales tax, less 20% in lots under 6,000 ft.

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **N. H., Nashua**—BA 5/15—Federal Aviation Agency, Fed. Bldg. No. 347, New York International Airport, Jamaica, N. Y., AIR ROUTE TRAFFIC CONTROL CENTER, Nashua By-pass-Dunstable and E. Dunstable Rds. $3,000,000. Extended date. Metcalf & Eddy, Statler Bldg., Boston, Mass., engrs. CD 2/27/61.

BUILDINGS—BA

▲ **Mass., Brookline**—BA 5/4—Brookline Housing Auth., 226 High St., P.H.A. Project Mass. 33-1, Low-Rent HOUSING DEVELOPMENT consisting multiple 100-dwelling units bounded by High, Walnut, Moss and Juniper Sts. Plans deposit $100. CD 9/7/60.

BUILDINGS—SLC

▲ **Mass., Boston**—Reva Enterprises, Inc., 525 Lincoln St., Worcester, Mass., soon lets contract Lincoln Lanes BOWLING CENTER, North Station. Over $2,000,000. Bishop & Hackett, 888 Purchase St., New Bedford, archts. CD 3/7/61.

HEAVY CONSTRUCTION—LB & CA

VERMONT—State Dpt. Hys., State Office Bldg., Montpelier, Bids opened 3/31, ROADS,

Lane Constr. Corp., 965 East Main St., Meriden, Conn., LB **$997,241**, est. $1,000,000, (7 bidders), Stage One, grading, drainage Int. Rte. 89, incl. 2 three-span composite WF beam bridges, Proj. I 89-2(9), Contract 3, Richmond, Williston. CD 2/14/61.

▲ **VERMONT**—State Dpt. Hys., State Office Bldg., Montpelier, ROADS,

Morrison-Knudsen Co., Inc., 150 East 42nd St., New York, N. Y., and **Landers & Griffin, Inc.**, 800 Islington St., Portsmouth, N. H., CA **$1,461,546**, Contract 2, stage one, grading, drainage 2.792 mi. Interstate Rte. 89, incl. 1 six-span composite WF beam bridge, Proj. I 89-2(9), Richmond-Williston. BA 3/24/61. CA 3/27/61. CD 3/29/61, under LB.

BUILDINGS—LB & CA

Bonneau Bros., Lisbon St., Lewiston, Me., rejected bids Feb. 15, SHOPPING CENTER, Lisbon St., LEWISTON, ME. LB **$734,038**. Will re-advertise. CD 2/23/61, under LB.

▲ **D. A. Sullivan & Sons, Inc.**, 82 North St., Northampton, Mass., CA **$1,184,374**, HIGH SCHOOL, Williston Ave., EASTHAMPTON, MASS. Town, Supt. Schools, Easthampton, Mass. BA 3/27, CA 3/27. CD 3/30/61, under LB.

Carroll Verge & Whipple, Inc., 370 Wahconah St., Pittsfield, Mass., LB **$906,841**, est. $900,000, (7 bidders), BOYS' CLUB ADDN., ALTERATIONS, Melville St., PITTSFIELD, MASS. Boys' Club of Pittsfield, Inc., 16 Melville St., Pittsfield, Mass. Prentice Bradley, 74 North St. Pittsfield, Mass., archt. Francis S. Harvey, 141 Dewey St., Worcester, Mass., engr. BA 3/28/61. CD 3/2/61.

▲ **George L. Hickey, Inc.**, 13 Spring St., Stamford, Conn., LB **$2,079,890**, (11 bidders), general construction, site development, Western JUNIOR HIGH SCHOOL, GREENWICH, CONN. Town, Dpt. P. Wks., Town Hall, Greenwich, Conn. BA 3/27/61. CD 2/23/61.

Urban Assocs., Inc., 39 Church St., New Haven, Conn., Owner Builds, **$987,000**, 175 units, 2 APARTMENT BLDGS., brick veneer exteriors, 1314 Quinnipiac Ave., 631 Russell St., NEW HAVEN, CONN. Carl Koch & Assocs., 55 Brattle St., Cambridge, Mass., archts. CD 3/29/61.

▲ **F. D. Rich Co.**, 550 Summer St., Stamford, Conn., LB **$3,343,000**, HOSPITAL ADDN., Stevens St., NORWALK, CONN. Norwalk Hospital, 24 Stevens St., Norwalk, Conn. BA 3/10/61. CD 2/13/61.

Giordano Constr. Co., 287 Main St., Branford, Conn., CA **$942,000**, Proj. MR-71, 100 unit garden-type duplex APARTMENTS for Elderly Residents, Wood End Homes, STRATFORD, CONN. Stratford Housing Auth., 857 Main St., Stratford, Conn. BA 3/23/61, CA 3/29/61. CD 3/29/61, under LB.

Irving H. Hill, Cook Hill, Wallingford, Conn., Owner Builds, **$740,000**, 74 HOUSES, Cook Hill Rd., WALLINGFORD, CONN. CD 1/3/61.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Brooklyn**—BA 4/18—Brooklyn Savings Bank, Pierpont and Clinton Sts., Zone 1, 4 story BANK and OFFICE, 205-211 Montague St. $2,000,000. Carson, Lundin & Shaw, 425 Park Ave., New York, Zone 22, archts. CD 1/28/60.

▲† **Md., Fort George G. Meade**—BA 4/19—U. S. Eng., 24 St. and Maryland Ave., Baltimore, 400 unit Capehart HOUSING, Unit 2, ENG 18-020-61-221. CD 3/31/61.

▲† **N. Y., Brooklyn**—BA 4/21—U., S. Eng., 111 East 16 St., New York, Zone 3, repairs and imprvs. incl. alterations to WHERRY HOUSING, Fort Hamilton, ENG 30-075-61-111. $1,000,000. Plans deposit $10.

▲ **Pa., DuBois**—BA 5/4—Pa. State Pub. School Building Authority, 101 S. 25th St., Harrisburg, HIGH SCHOOL, DuBois Area Jt. School Dist. $2,400,000. Plans deposit $50. Hunter, Campbell & Rea, 3601 5th Ave., Altoona, archts. CD 7/1/59.

▲ **Pa., White Haven**—BA 5/10—General State Authority, 18th and Herr Sts., Harrisburg, 4 WARD BLDGS., SEWAGE TREATMENT PLANT, WATER, HEAT and SEWERAGE SYSTEMS, ROADS, White Haven State School, $5,700,000. Lyle F. Boulware & George M. Ewing Co., 1720 Western Saving Fund Bldg., Phila. 7, Pa., archts. CD 5/23/60.

BUILDINGS—SLC

▲ **N. Y., Bay Shore**—Southside Hospital, Montauk Hy., soon lets contract, 3 story HOSPITAL ADDN., $1,300,000. Eggers & Higgins, 100 E. 42 St., New York, Zone 17, archts. Frederick J. Allardt, 50 Main St., Southampton, assoc. archt. Slocum & Fuller, 207 E. 22 St., New York, Zone 16, mech. engr. D. Stasio & Van Buren, 136 Liberty St., New York, Zone 6, struct. engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dept. P. Wks., State Office Bldg., Albany, ROADS,

N. Y.—L. G. DeFelice & Son, Inc., Nettleton Ave., North Haven, Conn., CA **$4,118,504**, est. $6,679,000 b. conc. Type 1A, 8.96 mi., b. conc, Type 1A (access) 3.44 mi., misc. work 0.12 mi. HGSS twin 3 sp. prestressed conc. bridge, 2 sps. 24.7 ft 2 sps. 41.6 ft., 2 sps. 39.2 ft. HGS twin, 3 span prestressed comb. br. 2 sps. 41.2 ft, 2 sps. 42.4 ft, 2 sps. 42.3 ft, twin 2 sp. comp. WF beam Br. 4 sps. 57 ft prestressed conc. Br. 5 sps. 254.7 ft, total R.R.G.S. twin 3 sp. comp. WF Br. 6 sps. 82.1 ft. prestressed conc. Br. 5 sps. 295.4 ft total Interstate Rte. 502, Sections A3, 7A4, 7A5, Rte. 22 to Salmon River Rd. Rte. 87, FISH 61 5 Proj. I-IG-87-4(11), Clinton Co.;

N. Y.—The Lane Constr. Corp., 965 East Main St., Meriden, Conn., CA **$3,673,744**, est. $4,375,000, 9 in. c. conc. pavt. 2.88 mi., b. conc. Type 1A, 0.04 mi., misc. work 0.16 mi. acc. 4.15 mi., c. conc. pavt. 0.86 mi. 8 H.G.S. Comp.-I-Beam, 4 sps. 196.8 ft total, 4 sps. 186.8 ft total, 3 sps. 179 ft. total, 3 sps. 171 ft. total, 3 sps. 195.8 ft. total, 3 sps. 133.5 ft total 3 sps. 159.75 ft. total, 3 sps. 202.3 ft total, Interstate Rte. connection 580 Rocheser Western Expressway (Buffalo Rd. to Howard Rd.) Elm Grove Rd., connection, Rte. 490. FASH 61-6 FASH 61-7, Proj. I-IG-490-2(21); U-783(6), Monroe Co.;

N. Y.—Hendrickson Bros., Inc., 63 N. Central Ave., Valley Stream, N. Y., CA **$567,234** est. $775,000 b. conc. 5.29 mi. Sag Harbor-Easthampton, SH 846 Rte. 114, R. C. 61-12, Suffolk Co.;

N. Y.—D. & T. Franzese Bros., Inc., 100 N. Franklin St., Watkins Glen, N. Y., CA **$549,209**, est. $653,000, 8 in. c. conc. pavt. 1.32 mi., b. conc. 0.17 mi. misc. work 0.03 mi. Chocton-Wayland, Pt. 1, SH 1104; Avoca-Wallace, Cohocton, SH 5565; Cohocton-Naples, Pt. 1, SH 5611, Rte. 15 & 371, FARC 61-1. Proj. F-627(12)S-523(11), Steuben Co.;

N. Y.—Hogebcom & Campfield, New Hartford, N. Y., CA **$1,647,954**, est. $2,190,000, c. conc. pavt. 6.01 mi., b. conc. 0.4 mi., prestressed concrete beam bridge 5 sps. 343.9 ft. total, Camden Taberg, Pt. 2, SH 5139 6.41 mi. Thomson Corners-Taber, SH 1158, Rome-Taber, SH 563, Rte. 69 FAPC 61-14. Proj. F-635(6),S-597(1) and U-635(6), Oneida Co. Grand total $10,556,645. BA 2/23, CA 3/20. CD 2/24/61 under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,

received no bids Mar. 29, Interstate Rte. Conn. 512 Gowanus Expressway-Cont. 3 (2nd Ave. to 20 St. incl. Prospect Expressway Interchange) 0.66 mi. 0.31 cc. mi. Int. Trg. Rte. 278, FIGE 61-1, Kings Co. $6,458,000. CD 2/28/61.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, BRIDGE,

American Bridge Division of U. S. Steel Corp., 501 John Fitch Way, Trenton, N. J., CA **$2,889,000**, superstructure steel Interstate Rt. 80 bridge over Hackensack River, Bergen Co. BA 3/16/61. CA 3/28/61. CD 3/21/61, under LB.

† **John C. Grimberg Co.**, 5501 Randolph Rd., Rockville, Md., LB Item 1, **$710,000**, LB Item 2, **$810,000**, (4 bidders), AIR CONDITIONING Treasury Annex Bldg., Wash., D. C., General Services Admin., 7th and D Sts. S. W., Wash., D. C. BA 3/28/61. CD 3/20/61.

BUILDINGS—LB & CA

Balling Brothers, 455 Young, North Tonawanda, N. Y., CA **$820,000**, Cardinal Neumann HIGH SCHOOL, Amherst, BUFFALO, N. Y. Catholic Diocese of Buffalo, 35 Lincoln Parkway, Buffalo, N. Y. BA 3/24, CD 3/10/61.

▲ **Terminal Constr. Corp.**, State Hy. 17, Wood-Ridge, N. J., CA **$8,107,000** general contract, concrete design Borgia Butler HOUSES, Proj. No. NYS-84, Section 1, Bldg. No. 1, community center, No. 3, boiler room; No. 4, No. 6, children's center and toy storage shelter, E.171 St. Webster Ave. E.169 St., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y., Grand total $11,312,135, BA 1/17, CA 3/15;

Afgo Engineering Corp., 475 Adelphi St., Brooklyn 17, N. Y., CA **$842,784**, heating and ventilating, Borgia Butler HOUSES, Proj. No. NYS-84, Bronx Boro (New York, N. Y.);

Herman H. Schwartz, Inc., 97-11 Sutphin Blvd., Jamaica, N. Y., CA **$717,470**, electrical work, Borgia Butler HOUSES, Proj. NYS-84, Bronx Boro (New York, N. Y.);

Far Plumbing Co., 2018 Croton Parkway, New York 60, N. Y., CA **$1,115,000**, plumbing, Borgia Butler Houses, Proj. NYS-84, Bronx Boro(New York, N. Y.);

Otis Elevator, 260 11 Ave., New York 1, N. Y., CA **$529,881**, elevators, Borgia Butler HOUSES, Proj. NYS-84, Bronx Boro (New York, N. Y.).

▲ **Walter A. Stanley Constr. Co., Inc.**, RR Ave., Ossining, N. Y., CA 2 story, 150,000 sq. ft. PRODUCT DEVELOPMENT LABORATORY, POUGHKEEPSIE, N. Y. International Business Machines Corp., 590 Madison Ave., New York 22, N. Y. BA 3/15 CD 2/23/61.

Thompson Brinkworth, Inc., 250 East 43rd St., New York, N. Y., CA Est. **$850,000**, 92-bed NURSING HOME South Van Dien Ave., RIDGEWOOD, N. J. Barney Van Dyk & Sons, 244 Godwin Ave., Ridgewood, N. J. Carl Kemm Loven, 119 Rock Rd., Glen Rock, N. J., archt.

▲ **New Jersey Post Contr. Co.**, 8150 Union Ave., Pennsauken, N. J., CA **$1,250,000**, two DORMITORIES, Lawrence Road campus, Lawrence Township, TRENTON, N. J. Rider College, 428 East State St., Trenton, N. J. BA 3/23/61. CA 3/31/61. CD 3/29/61, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

† **S. C., Charleston**—BA 4/25—P. Wks. Office, 6th Naval Dist., Bldg. 13, U. S. Naval Base, FIRE CONTROL and NAVIGATION BLDG., Charleston Naval Shipyard, NBy-31327, $500,000-$1,000,000. CD 7/22/60.

▲† **Mississippi**—BA 4/26—U. S. Eng., P.O. Box 60, Vicksburg, UPPER BANK PAVING at several localities on banks of Mississippi River between Miles 530 and 230 AHP. Sched. I, 52,000 sq. asphalt upper bank paving, $1,000,000; Sched. II, 38,000 tons riprap Upper Bank Paving and 14,000 tons gravel on crushed stone. $300,000. Plans deposit $1. CD 4/22/44, under Illinois and Louisiana.

▲† **Fla., Miami**—BA 5/31—Federal Aviation Agency, P.O. Box 1689, Fort Worth Tex., AIR ROUTE TRAFFIC CONTROL CENTER BLDG., and UTILITIES, $1,750,000. Plans deposit $15. CD 10/27/60.

(Continued on page 152)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported n low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

One mistake you need never make is buying obsolescence in a concrete plant

Any prudent buyer, making a practically lifetime investment in a concrete plant, will today insist that it be *up to standard*.

The purchaser has two compelling reasons. A plant built of "CPMB" certified components embodies the most advanced design and operational efficiency, developed by engineers and builders who have produced most of the concrete plants now in use. It is structurally and functionally today's best, and the capacity of every one of its components is defined and guaranteed by Rating Plate.

Even more important, a standard plant, today, is designed to accept tomorrow's improvements. The company that built it will still be in business, will know every detail of the plant's construction, and will be prepared to up-date any mechanical or electronic equipment or structural part.

Backed by 236 Years Experience

Plants and components certified by official Rating Plate are available from all members of the Concrete Plant Manufacturers Bureau (CPMB). The quality standards they have adopted represent their combined experience of 236 years, and have been approved by the Board of Directors of the National Ready Mixed Concrete Association.

Copies of "Concrete Plant Standards" are freely available to ready mixed concrete producers, contractors and engineers interested in quality standards. Address your request to the Concrete Plant Manufacturers Bureau, 1411 K Street, N.W., Washington 5, D.C.

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An Affiliate of the National Ready Mixed Concrete Association

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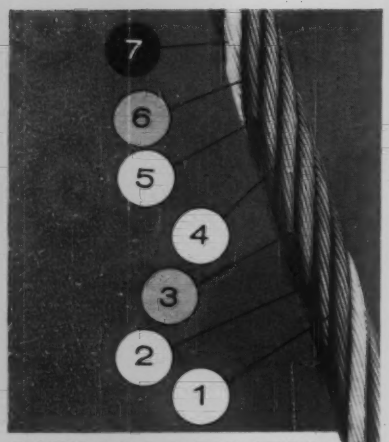
THE HELTZEL STEEL FORM AND IRON COMPANY
Warren, Ohio

THE C. S. JOHNSON COMPANY
Champaign, Ill.

NOBLE COMPANY
Oakland, Calif.



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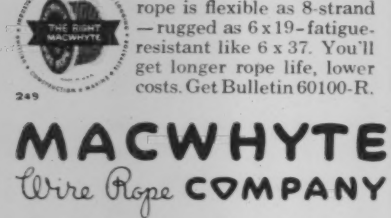

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REUSABLE RUBBER VOID FORMS FOR SEWERS, SLABS, DRAINS & DUCTS. SUPERSEDES ALL VOID FORMING TECHNIQUES.

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A Division of **EQUITABLE MANAGEMENT, INC.**
690 Market Street, San Francisco
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(Continued from page 150)

BUILDINGS—BA

▲ **N. C., Greensboro**—BA 4/20—Guilford Co. Bd. Educ., Courthouse, 100,000 sq. ft. Southeast CONSOLIDATED HIGH SCHOOL, $1,300,000. Extended date. CD 3/21/61.

▲ **Fla., Fort Pierce**—BA 4/26—Fort Pierce Housing Auth., City Hall, 250 low rent HOUSING UNITS. $1,800,000. Plans deposit $100. Starratt & Asklof, 605 N. 7th St., archts., CD 7/13/60.

▲ **S. C., Clinton**—BA 4/26—State Mental Health Comn., State Office Bldg., Columbia, intensive TREATMENT HOSPITAL at Whitten Village for Mentally Retarded Children. $1,000,000. Plans deposit $100. Baker & Gill, 609 Chestnut St., Florence, archts. CD 2/15/61.

BUILDINGS—SLC

▲ **Fla., Miami**—The Lutheran Senior Citizens Foundation, Inc., c/o Steward-Skinner, Assocs., archts. Du-Pont Plaza Center, soon lets contract East Ridge RETIREMENT VILLAGE, swimming pool, air conditioning, ventilation, heating, electric, paving, landscaping, etc., between SW 190th St. and 197th, west of Old Cutler Rd. $5,000,000. Clyde E. Williams & Assocs. of Florida, 5138 Biscayne Bldg., civil engrs. Mitchell Gordon, Assocs., 302 Bird Rd., Coral Gables, mech. elect. engrs. CD 12/14/60.

HEAVY CONSTRUCTION—LB & CA

▲ **NORTH CAROLINA**—State Hy. Comn., Capitol Bldg., Raleigh. Bids opened 3/28, ROADS,

N. C.—**Thompson-Arthur Paving Co.**, 300 Benbow St., Greensboro, N. C., LB **$707,622**, grading, CABC, b. conc. binder and surf., fencing, 10.84 mi. resurf. necessary constr. on existing west bound lane of Interstate Rte. 85 between N.C. 61 and N.C. 54, Proj. 8.15019, I-85-3(18)136; Guilford-Alamance Counties; LB **$759,608**, grading, b. conc. base, surf., fencing 11.63 mi. resurf. necessary constr. on existing west bound lane of Interstate Rte. 85 between NC 54 and Efland, Proj. 8.15045, I 85-3(19)147, Alamance and Orange Counties; LB **$108,589**, grading, CABC, BST or S.A. surf., structures 2.67 mi. Secondary Rd. 1931 from its junction with State Rte. 1939, southeast to BST county road at Moncure High School, Proj. 8.26128, S 1407(1) Chatham Co.;

N. C.—**Dickerson Inc., Box 448**, Monroe, N. C., LB **$1,478,871**, fine grading, STBC, CABC, c. conc. stab. base, BST b. or conc. base, surf. 9.85 mi. surf. Interstate Rte. 95 from point on US 301 approx. 1.5 mi. north to point on NC 20, west of St. Pauls, Proj. 8.13979, I 95-1(9)22 Robeson Co.; LB **$245,854**, S.A. base, surf., b. conc. surf. shoulder constr. 33.2 mi. resurf. NC 97 from US 301-A, north of Rocky Mount, east to point 1 mi. west of Leggetts, NC 44 from US 258 at Princeville, east to State Rte. 1512, N.C. 44, from point 0.1 mi. northwest of NC 97 at Leggetts, southeast to US 64, north of Tarboro, US 258 from Edgecombe Co. line north to point in Scotland Neck, Proj. 8.11254, S8.11285, 8.11286, 8.11385, F-283(4) S 372(2) F 567(8) S 405(1) Edgecombe and Halifax Counties;

N. C.—**Rea Constr. Co.**, 209 W. 4th St., Charlotte, N. C., LB **$2,079,000**, grading, concrete pavement 11.18 mi. addnl. lane US Rte. 29 between Greensboro and Rockingham Co. Line, Proj. 8.15364 F 15(12) Guilford Co. CD 3/9/61.

▲ **SOUTH CAROLINA**—State Hy. Dpt. Office Bldg., corner of Senate and Assembly Sts., Columbia, ROAD;

Green Constr. Co., Box 4115, Station B, Spartanburg, S. C., CA **$1,146,612**, Alternate No. 1, concrete gutter, 24 in. bottom, Alternate No. 2, cement rubble masonry, gutter, S.D. Docket Nos. 4.508 & 37.426, F.A. Proj. No. I-85-1(3), Parts 1 and 2, Anderson Co. BA 1/17/61. CD 1/25/61, under LB.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee, BRIDGES,

Hardaway Contg. Co., Box 477, Port Tampa, Fla., CA **$1,401,640**, constructing Bridge Structures "A", "B" and "C", of 690 ft., 666 ft. and 2,552 ft. lengths respectively, Structures "A" and "B" are of conc. slab deck and prestressed conc. beam spans on prestressed conc. pile bents; Structure "C" is composed of and electrically-operated double-leaf bascule span, two steel I-Beam flanking spans and prestressed conc. beam approach spans, on conc. pile bents; conc. handrail; guardrail; timber fender systems, navigation lights; electrically-operated safety gates; conc. sheet pile bulkheads; approx. 3,908 lin. ft. State Proj. Job No. 15200-3501, Pinellas Bay-Way System, Pinellas Co. BA 9/30/61, CA 3/24/61. CD 10/5/60, under LB.

▲† **Great Lakes Dredging & Dock Co.**, 228 N. LaSalle St., Chicago, Ill., CA **$1,783,000**, CANAL 43, SECTION 1, Caloosahatchee River, Central and Southern Florida Flood Control Project, ENG-08-123-61-56, FLORIDA, U. S. Eng., Box 4970, Jacksonville, Fla. BA 3/15/61, CA 3/28/61. CD 3/21/61, under LB.

▲† **James P. Cross**, 120 Iberia St., New Iberia, La., CA **$2,612,227**, LEVEE 29, SECTION 2, STRUCTURES 12A, B, C, D, E and 14 and location of US Hy. 41 on Crown of levee Central and Southern Florida Flood Control Project, ENG-08-123-61-54, FLORIDA, U. S. Eng., Box 4970, Jacksonville, Fla. BA 3/14, CA 3/28/61. CD 3/21/61, under LB.

† **Bauer Dredging Co.**, Box BB, Port Lavaca, Tex., CA **$763,206**, DREDGING 36 x 260 ft. Intermim Channel, Mississippi River-Gulf Outlet, St. Bernard Parish, CIVENG-16-047-61-118, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. BA 3/8, CA 3/31. CD 3/27/61, under LB.

▲† **Ralph Myers Constr. Co.**, P.O. Box 230, Salem, Ind., LB $1,821,420, est. $2,307,768, (9 bidders), DAM and SPILLWAY, Nolin Reservoir, 17 mi. from Leithfield, Edmondson Co., CIVENG-15-029-61-32, KENTUCKY. U. S. Eng., P.O. Box 59, Louisville 1, Ky. BA 3/30. CD 2/24/61.

BUILDINGS—LB & CA

† **Sig Mathesen**, 123 West Gilpen Ave., Norfolk, Va., LB **$759,470**, est. $773,118, 2 story masonry FLEET COMPUTER PROGRAMMING CENTER, (First Increment), Fleet Anti-Warfare Training Center, NBy 36967, Spec. No. 36967/61, DAM NECK, VA. Dist. P. Wks. Office, Fifth Naval Dist., Norfolk, Zone 11, Va. Clark, Buhr & Nexsen, Midtown Bldg., Norfolk, Va., archts **Fraioli-Blum-Yesselman**, 1214 **Granby St., Norfolk**, Va., engrs. BA 3/28/61. CD 3/7/61.

▲ **Blake Constr. Co.**, 1120 Connecticut Ave. N. W., Wash., D. C., CA **$5,248,000**, MEDICAL EDUCATION BLDG., RICHMOND, VA. Medical College of Virginia, 523 North 12th, Richmond, Va. BA 2/28/61., CA 3/28/61. CD 3/6/61, under LB.

▲ **Brown-Johnson Inc.**, 828 W. Lee St., Greensboro, N. C., Owner builds, **$1,440,000**, 120 RESIDENCES, GREENSBORO, N. C.

▲† **Thompson & Street**, Clanton Rd. and **Blythe Co.**, 2911 Graham St., Charlotte, N. C., LB **$7,287,600**, 500 units CAPEHART HOUSING, U. S. Naval Base, NBy-34594, CHARLESTON, S. C. Dist. P. Wks. Office, 6th Naval Dist., Charleston, S. C. Reid Hearn & Associates, 600 Belt Line Blvd., Columbia, S. C., archts. BA 3/30/61. CD 2/27/61.

Ray Newton, 1267 Peachtree St., N. E., Atlanta, Ga., Owner Builds, **$800,000**. 120 APARTMENT UNITS, EAST POINT, GA.

▲ **Newton & Rushton, Inc.**, P.O. Box 191, Vidalia, Ga., CA **$2,479,000**, TREATMENT BLDG., Milledgeville State Hospital, MILLEDGEVILLE, GA. State Dept. P. Health, State Office Bldg., Atlanta, Ga. **(Correction**—contractor). CD 2/23/61, under CA.

Garden Lakes Housing Co., 2400 Garden Lakes Blvd., Rome, Ga., Owner Builds, **$770,000**, 70 RESIDENCES, ROME, GA.

▲ **Dworman Assoc.**, 400 Park Ave., New York, N. Y., Owner Builds, **$4,000,000**, 12 story Mandalay Shores APARTMENT, CLEARWATER BEACH, (STA. CLEARWATER), FLA., C. Dale Dykema, 1000 58th St. N., St. Petersburg, Fla., archt. CD 12/13/60.

Martin Constr. Co., 102 Antigua Dr., Cocoa Beach, Fla., LB **$730,000**, (8 bidders), Cape Canaveral HOSPITAL, Cocoa Beach Causeway, Proj. FLA. A-69, COCOA BEACH, FLA. Cape Canaveral District Hospital, Bd., Cocoa Beach, Fla. BA 3/29/61. CD 3/21/61.

▲ **M. R. Harrison Constr. Corp.**, 1000 N.W. 54th St., Miami, Fla., LB **$2,574,470**, (7 bidders), Richter Memorial LIBRARY, University of Miami, CORAL GABLES, FLA. University of Miami, 1200 Campo Sano Ave., Coral Gables, Fla. N. J. Dignum & Assocs., 260 Palermo Ave., Coral Gables, Fla., engrs. BA 3/30/61. CD 3/10/61.

▲ **Clutter Constr. Corp.**, 377 Westward Dr., Miami Springs, Fla., LB **$1,310,000**, (5 bidders) St. Lucie County COURTHOUSE and JAIL, FORT PIERCE, FLA. Bd. Comrs. St. Lucie Co., Fort Pierce, Fla. BA 3/29/61. CD 2/24/61.

Algernon Blair Co., First National Bank Bldg., Montgomery, Ala., LB **$804,400**, Denny STADIUM ADDN., ALTERATIONS, TUSCALOOSA, ALA. University of Alabama, P.O. Box 1957, Tuscaloosa, Ala. BA 3/23/61. CD 3/2/61.

▲ **J. M. Brown Constr. Co. Inc.**, Box 102, Shreveport, La., CA **$1,380,504** Part 1 and 2 story masonry NEWSPAPER PLANT, SHREVEPORT, LA. Shreveport Times, Shreveport Journal Publishing Co., 408 Marshall St., Shreveport, La. BA 3/16, CA 3/27. CD 3/22/61, under LB.

Barge-Thompson, Inc., P.O. Box 19795, Station N., Atlanta, Ga., CA Est. **$750,000**, Central dial OFFICE ADDN., NASHVILLE, TENN. Southern Bell Telephone & Telegraph Co., 178 8th. Ave. N., Nashville, Tenn. CD 3/8/61.

MIDDLE WEST

BUILDINGS—BA

Wis., Delavan—BA 4/26—State Dpt. P. Welfare, Capitol Bldg., Madison, VOCATIONAL and ELEMENTARY SCHOOL. $750,000. Plans deposit $50. Darby, Bogner & Assocs., 8801 W. National Ave., West Allis, archts. R. D. Culvertson, Madison, state engr. CD 12/9/60.

O., Cincinnati—BA 5/2—Jewish Hospital, Burnet Ave., GREENWOOD HALL NURSES' HOME ADDN., REMODELING X-RAY PAVILION, $950,000. Plans deposit $50. Potter, Tyler, Martin & Roth, 128 E. 6th St., archts. Ziel & Blossom, Gwynne Bldg., engrs. CD 2/23/60.

▲† **O., Dayton**—BA 5/23—Veterans Admin., Munitions Bldg., Wash., D. C., BOILER PLANT, DISTRIBUTION SYSTEMS, ELEVATORS and CONNECTING CORRIDORS, Veterans Administration Center. $2,000,000, CD 8/19/60.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, ROAD;

V. N. Holderman & Sons Co., 890 Oakland Park Ave., Columbus, O., CA **$4,775,241**, Type T 71, structures, 10.425 mi. US Rte. 50, Sections 35.45, 0.00, F-FG-471(10), Village of Coolville and in Troy Twp. and Belpre Twp., Proj. 95, Athens and Washington Counties. CA 3/14/61. CD 3/20/61, under LB.

(Continued on page 156)

Today: *4 Michigan Dozers for this major Midwest contractor.* Tomorrow: *15*

Each replaces 2 crawlers, 1 roller

At first glance, this *looks* like a typical big-job spread of equipment. Twenty tractors. Fifteen self-propelled scrapers. Sixty dump trucks. But then you look again. Four of the tractors are on rubber. All Michigans.

"And come back in a few years," says the contractor, Chelsea Utterback, Mt. Pleasant, Michigan, "and *almost all* our tractors on the grade will be rubber-tired Michigans!"

The reasons are pretty obvious. The Michigan units are *fast*—dozing and push-loading at speeds up to 6 mph, running job-to-job at speeds up to 28 mph. *They're economical*—on the basis of Utterback's experience, tires outlast tracks in sand "at least 6 to 1." *They help compaction.* And Michigans come in a *range of sizes* to match the workload. Utterback Construction Company owns 162 and 262 hp units; 375 and 600 hp models are also available.

Speedy 262 hp unit also increases push-loading output

Utterback's 262 hp Model 280 often handles push-loading of 18-yd scrapers. Load time in typical sandy material averages 40 seconds. Load size averages 13 to 15 pay yds. "Overall scraper cycle time is further reduced," says Mr. Utterback, "by the Michigan's ability to quickly boost each pan out of the pit —and by its high-speed return. On cycles of 1000 to 2000 ft, we actually get an *extra load per scraper per hour!*"

Another major production advantage can be noted on the fill. Here, a Model 280 and two Model 180 Michigans spread 14,000 to 18,000 pay yards of sand and clay per day. Their dozing speed averages 7 to 12 mph. Moreover, compaction after the several passes necessary for normal dozing often reaches 98% (Proctor). "*On many jobs, each Michigan Tractor Dozer thus turns loose from fill assignment two crawlers and a roller,*" reports Mr. Utterback.

Job-to-job at 28 mph

On the contract shown—9 miles of four-lane bypass superhighway around Midland, Michigan—the Model 180 Tractor Dozers are being used alternately on two widely-separated fill sections. Self-powered truck-like speed saves valuable time. The machines also backfill drainage structures and handle finish-grading.

"By working a 162 hp Model 180 *two hours* overtime on backfilling, we accomplish work *it would take a crawler all day to do,*" the contractor states.

Overtime replaces double-shifting

In addition to observing all the standard rules for construction equipment servicing, Chelsea Utterback has a notable one of his own. Each machine is assigned an individual operator, and when double-shift operation ordinarily would be required, that operator stays with his machine for a limited number of overtime hours. Mr. Utterback is convinced by his production records that his system pays off.

He's equally convinced, from the same records, that so far as Dozers are concerned, dependable Michigans pay off "most of all."

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK® EQUIPMENT

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This mark tells you a product is made of modern, dependable Steel.

Kinnickinnic River Project, under the direction of the Sewerage Commission of the City of Milwaukee.
General Contractor: The Drumi Company, Inc.
Culvert Fabricator: Capital City Culvert Corporation, Madison, Wisconsin.

Steel culverts saved over $30,000 here

When this narrow river channel had to be widened and paved to prevent continual flooding, the contractors considered using electric pumps to keep the construction area drained. One look at the cost and they decided there must be a better way. There was. They bought 400 feet of corrugated galvanized steel drainage pipe made from USS Corrugated Culvert Sheets and saved over $30,000.

These steel culverts are 48″ in diameter and can carry a million gallons of water an hour. They're strong, durable, corrosion-resistant and easy to install—it only took five men about eight hours to put them down. And when the channel was being paved, a crew merely rolled the whole culvert out of the way. After the job was finished, they removed the culverts to be used again.

For more information about galvanized culvert sheets for steel drainage pipe, send for our free booklet, "Culvert Sheets for Metal Drainage Products." Write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation, Pittsburgh • Columbia-Geneva Steel, San Francisco • Tennessee Coal & Iron, Fairfield, Alabama
United States Steel Supply, Steel Service Centers • United States Steel Export Company

USS United States Steel

TRADEMARK

(Continued from page 152)

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield, ROADS,

Ill.—**Peter Kiewit Sons Co.**, 257 E. 147th St., Harvey, Ill., CA **$3,083,000**, pavement 3.74 mi. FAI Rte. 80 from approx. 2 mi. south of Green River easterly to approx. 4 mi. west of Geneseo and pavement 2.44 mi., FAI Rtes. 74 and 80, incl. eight paved ramps at interchange with FAI Rte. 74 and FAI Rte. 80 approx. 8½ mi. west of Geneseo, Henry Co.; CA **$2,039,123**, pavement 5.23 mi. FAI Rte. 80 and four paved ramps at interchange with Ill. Rte. 82 southwest of Geneseo, Henry Co.; CA **$2,469,822**, pavement 5.66 mi. FAI Rte. 74 and frontage roads southwest of Colona at two locations, from US Rte. 150, easterly and from approx. 3½ mi. east of US Rte. 150, easterly, Rock Island and Henry Counties;

Ill.—**Rock Road Constr. Co.**, 5915 Rodgers Ave., Chicago, Ill., CA **$1,292,411**, pavement 1.13 mi. FAI Rte. 90 and North Ave., ramps at three interchanges and frontage roads, Elmhurst and North Lake, Cook and DuPage Counties;

Ill.—**Robert R. Anderson**, 4550 W. Patterson Ave., Chicago, Ill., CA **$1,247,298**, base course, resurf. 0.76 mi. Cermak Rd. (Ill. Rte. 55) from Norfolk Ave., Westchester, easterly, 10 span cont. railroad grade separation carrying Cermak Rd. over IHB RR and 3-span cont. grade separation structure carrying Cermak Rd. over 25th Ave., Ill. Rte. 55, Westchester and Broadview, with exception of furnishing, fabricating structural steel, incl. retaining walls and paved approaches, Cook Co. Grand total $10,131,654. BA 3/10/61. CD 3/14/61, under LB.

▲ **Arcole Midwest Corp.**, 3225 Main St., Skokie, Ill., CA **$6,317,089**, est. $8,000,000, APRON and TAXIWAY, PAVING, No. 80.85-61-38, Contract RB 41, O'Hare Airport Park Ridge, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 3/13/61. CA 3/28/61. CD 3/16/61, under LB.

▲ **Great Lakes Drdege & Dock Co.**, 228 North La Salle St., Chicago, Zone 1, Ill., CA **$1,839,180**, HARBOR IMPRVS., 5,070 ft. channel dredging, Navy Pier, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 2/10/61. CD 2/16/61, under LB.

▲ **WISCONSIN**—State Hy. Comn., Rm. 535, State Office Bldg., Madison, ROADS,

Wis.—**Linnan Constr. & Engineering, Inc.**, 16500 Pheasant Dr., Brookfield, Wis., LB **$536,140**, grading, base, concrete pavement, Structures B 40-123 and B 49-124, 0.428 mi. West National Ave. (West Expressway-West Lincoln Ave.) and West Expressway (West National Ave. overpass) Proj. U 015-2(5) and I 894-7(5)305, STH 15 and I Hy. 894, Milwaukee Co.;

Wis.—**Lee H. Parker**, 2015 N. Richmond St., Appleton, Wis., LB **$994,918**, grading, base, cont. rein.-con. 5.591 mi. Contract 1 Oshkosh-Neenah Rd., Proj. F 03-2(53) USH 41 Winnebago Co.;

Wis.—**Hoffman Constr. Co.**, Black River Falls, Wis., LB **$578,234**, grading, subbase 2.5 mi. Contract 1, Madison-Janesville Rd., 9 E. Church Rd.-Maple Grove Rd. Proj. I 90-3(42)154, Dane Co. CD 2/28/61.

▲ **WISCONSIN**—State Hy. Comn., Rm. 535, State Office Bldg., Madison, ROADS,

Wis.—**Ryan Bros. Co.**, P.O. Box 206, Janesville, Wis., CA **$2,396,569**, grading, base and concrete pavement structures B67-44, 45, 47, 70, 71 and 72, Contract 1, 3.52 mi. Madison-Milwaukee Rd. (Goerkes Corners-Calhoun Rd. Section) and Goerkes Corners-Brookfield Rd., Proj. I 94-3(22)296 and F 016-1(33), Waukesha Co. BA 3/28/61. CD 4/4/61, under LB.

Wis.—**N. M. Isabella, Inc.**, 2715 W. Badger Rd., Madison, Wis., CA **$716,562**, concrete pavement 2.051 mi. Contract 1, Lake Delton Madison Rd. (USH 151-Badger Interchange and Burke Overpass approaches), Proj. I 90-2(57)136 and IG 90-2(51)136, Hy. 90, Dane Co.

BUILDINGS—LB & CA

▲ **R. S. Ursprung Co.**, Hanna Bldg. Annex, Cleveland 15, O., LB **$1,737,700**, (9 bidders), general contract HIGH SCHOOL, BEREA, O. Bd. Educ., 390 Fair St., Berea, O. BA 3/28/61. CD 3/20/61.

Spohn Heating & Ventilating Co., 1775 E. 45th St., Cleveland 3, O., LB **$605,675** (7 bidders) mechanical contract, high school, (Berea, O.).

▲ **Brune-Harpenau Builders, Inc.**, 6475 Glenway Ave., Cincinnati, O., Owner Builds, **$7,500,000**, 3 year program, $2,192,000 1st year, 450 one story, bsmntless HOUSES, street off Cleves-Warsaw Pk., CINCINNATI, O. Joseph M. Allen Co. 5555 Glenway Ave., Cincinnati, O., engr.

▲ **Medina Corp.**, 124 W. Washington St., Medina, O. Owner Builds **$1,000,000**, 100,000 sq. ft. MFG. PLANT, MEDINA, O. Plastic-Kote, Inc., lessee. CD 1/28/60, under O., Cleveland. Plasti-Kote, Inc., 9801 Harvard Ave., Cleveland, O., as owner.

▲ **Leo C. Miller**, 333 E. Bloom St., Louisville 17, Ky. CA **$3,579,000**, Floyd County HOSPITAL EXPANSION, NEW ALBANY, IND. New Albany-Floyd Co. Bldg. Auth., Courthouse, Spring and State Sts., New Albany, Ind. BA 3/28/61. CA 3/28/61. CD 3/30/61, under LB

▲ **H. Kaplan Co.**, 188 W. Randolph St., Chicago, 1, Ill., CA **$1,000,000**, SHOPPING CENTER, 50th and Racine Ave., CHICAGO, ILL. Julian Schwartz & Jos. Newman, c/o Sidney H. Morris & Assocs., archts., 173 W. Madison St., Chicago, 2, Ill. CD 3/21/61.

▲ **George Sollitt Constr. Co.**, 109 N. Dearborn St., Chicago 2, Ill., CA **$1,200,000**, 3 story, 98,000 sq. ft. ART GALLERY ADDN., Morton Wing, CHICAGO, ILL. Art Institute of Chicago, Michigan Ave. and Adams Sts., Chicago, Ill. BA 1/31/61. CD 1/11/61.

▲ **Ragnar Benson, Inc.**, 4744 W. Rice St., Chicago, Ill., CA **$8,100,000**, BAKING PLANT ADDN., CHICAGO, ILL. National Biscuit Co., 7300 S. Kedzie Ave., Chicago, Ill.

▲ **O. Madsen & Son, Inc.**, Sexton Bldg., Minneapolis, Minn., LB **$2,096,000**, MATHEMATICS BLDG. MADISON, WIS. Wisconsin State Bldg. Corp., Capitol Bldg. Madison, Wis. BA 3/29/61. CD 2/23/61.

▲ **Drobac & Assocs.**, 3815 N. Teutonia Ave., Milwaukee, Wis. CA Est. **$1,500,000**, MOTOR HOTEL, MILWAUKEE, WIS. Owner, c/o Sheldon Segel archt., 1744 N. Farwell Ave., Milwaukee, Wis.

▲ **Campbell Constr. Co.**, 9301 Michigan Ave., Detroit 10, Mich., CA Est. **$1,000,000**, 4 story, glass, brick, stone Office, Woodward Ave. between Euclid and Philadelphia Aves., DETROIT, MICH. Great Lakes Mutual Life Insurance Co., 82 E. Hancock, Detroit, Mich. CA 3/28. CD 5/27/60.

University of Detroit, 4001 McNichols Rd. W., Detroit 27, Mich., rejected bids Jan. 11, Lansing-Reilly HALL ADDN., DETROIT, MICH. LB **$969,600**. Will readvertise. CD 1/17/61, under LB.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲ **Minnesota**—BA 4/21—State Hy. Dpt., Capitol Approach, St. Paul, STORM SEWER, 1,350 lin. ft. 12- to 18-in. sewer, 80 lin. ft. manhole and catch basin, 285 sq. ft. concrete walk and 194 lin. ft. Design V618 concrete curb and gutter SP 2713-16 (TH 12-10), Wayzata, Hennepin Co. Plans deposit 60c.; STORM SEWER TUNNEL along Stevens and Second Ave. So., Minneapolis between E. 27 St. and E. 39 St., Hennepin Co., SP 2782-17 (TH 35W-394), Minn. Proj. I 35W-3 (43)108. Plans deposit $1.10. Total est. $1,000,000.

▲ **Tex., Midland**—BA 4/28—City, City Hall, IMPROVING RUNWAY, **$1,695,000**. CD 3/22/61.

▲† **Arkansas and Tennessee**—BA 5/4—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., PILE DIKE CONSTRUCTION at Wrights Point, Arkansas, (Mile 720AHP), Randolph Point, Tennessee, (Mile 745 AHP) and Dismal Point, Arkansas, (Mile 720 AHP), CIVENG-40-041-41-79, $1,500,000. CD 4/22/44, under Illinois-Louisiana.

▲† **Oklahoma**—BA About 5/10—U. S. Eng., Box 60, Tulsa, RELOCATING State Hy. 99 and BRIDGE over Arkansas River (three schedules) Keystone Reservoir, ENG-34-066-61-100, $1,500,000. Plans deposit $10. CD 9/29/59.

† **Okalhoma**—BA About 5/11—U. S. Eng., Box 61, Tulsa, Zone 2, RELOCATION U. S. HY NO. 69 and M-K-T Railroad, surfacing Sect. II, Eufaula Reservoir, Canadian River, ENG-34-066-61-102, $900,000. CD 9/30/60.

BUILDINGS—BA

† **Neb., Hastings**—BA 5/2—Dist. P. Wks. Office, Ninth Naval Dist., Bldg. 1A, Great Lakes, Ill., AIRCRAFT CONTROL and WARNING FACILITIES, SM133, Hastings Air Force Base, Naval Ammunition Depot, Spec. 35753/61. $500,000-$1,000,000. CD 3/23/61.

Tex., Austin—BA 5/2—University of Texas, Main Admin. Bldg., Austin, ARTS and MUSEUM, $900,000. Plans deposit $50. Jessen, Jessen, Millhouse & Greeven, 2816 Hemphill Park, and Kuehne, Brooks & Barr, 203 Perry Brooks Bldg., Austin, archts. CD 8/17/60

▲ **Neb., Omaha**—BA 5/4—Bd. Educ., 3902 Davenport St., Southeast JUNIOR HIGH SCHOOL, $1,500,000. Plans deposit $100, general constr., and $50 for electrical and mechanical. Leo A. Daly Co., 8600 Indian Hills Drive, archt. CD 12/22/59.

BUILDINGS—SLC

▲ **Minn., Brooklyn Center (Minneapolis P.O.)**—At Office Dunlap & Esgar, Inc., archt., 333 N. Michigan Ave., Chicago, Ill., soon lets contract 165x200 ft. DEPARTMENT STORE tract adjoining Brookdale Shopping Center, Hy 100, Shingle Creek, 59 Ave. and Osseo Rd. for Sears, Roebuck & Co., 925 S. Holman Ave., Chicago, Ill. (C. W. Bach, mgr. Twin City Stores, 900 E. Lake St., Minneapolis, Minn.). $2,000,000. CD 8/8/60.

HEAVY CONSTRUCTION—LB & CA

▲ **NEBRASKA**—Dpt. Rds., State Capitol, Lincoln, Bids opened 3/30, ROADS,

Neb.—**Missouri Valley Constr. Co.**, P.O. Box 811, Grand Island, Neb., LB **$126,359**, constr. 3.4 mi. oiled road, Mullen north grading, conc. pavement, culverts, guard rail, armor coat, bit. sand, RC, Proj. No. S-277(6), Hooker Co.; LB **$545,654**, 13.2 mi. oiled road, Arapahoe-Elwood, grading, gravel-detour, 2 bridges, SA base course, AC surf., culverts, etc., grading, culverts, bridges, asph. conc. surf., Proj. No. F-252(8), Furnas and Gosper Counties; LB **$260,004**, 6.9 mi. oiled road Arapahoe-Elwood, grading, gravel-detour, culverts, SA base course, AC surf., etc., Proj. No. F-252(7), Gosper Co.; LB **$262,227**, 1.8 mi. paved road Grand Island-Aurora, grading, pavement, culverts, two bridges, guard rail, Proj. No. F-228(18), Hall Co.; LB **$830,335**, 8.5 mi. paved road Doniphan-Grand Island, grading, pavement, culverts, guard rail, etc., Proj. No. F-215(3), Hall Co.; LB **$174,575**, 4 mi. oiled road Grand Island-Chapman, grading, culverts, two bridges, guard rail, base courses, asph. concrete surf., Proj. No. S-104(2), Hall Co.;

Neb.—**Abel Constr. Co.**, 1815 Y St., Lincoln, Neb., LB **$1,564,579**, 7.8 mi. paving, York-Lincoln Rd., grading, pavement, culverts, 10 bridges, fence, No. I-80-8(11) and S-838(2), Lincoln; LB **$429,493**, grading, 7.8 mi. paving York-Lincoln Rd., Lincoln Co. CD 3/23/61.

† **Turner Constr. Co.**, 406 S. 2nd. St., Sioux Falls, S. D., CA **$900,568**, Missouri River Basin Proj., constr. of EARTHWORK, STRUCTURES for Farwell Main Canal, Sta. 766 plus 00 to 1730 plus 00 and Farwell Lower Main Canal, DC 5497, St., NEBRASKA. Bureau Reclamation, Dpt. Interior, St. Paul, Neb. BA 3/14/61. CD 3/20/61, under LB.

▲ **Shamrock Constructors, Inc.**, Dodge City, Kan. CA Est. **$1,500,000**, 75 mi. 4- to 12-in. NATURAL GAS PIPE LINE from Oakwood to Piedmont, OKLAHOMA Mustang Fuel Corp., 2901 Classen St., Oklahoma City 6, Okla. CA 3/31/61. CD 3/30/61.

▲ **A & A Constr. Co.**, 3720 W. Broadway, Muskogee, Okla., CA **$1,187,637**, 8 mi. 42 in. concrete or steel WATERPIPE LINE, LAWTON, OKLA. City, City Hall, Lawton, Okla BA 2/28/61. CD 3/16/61, under LB.

United Gas Pipeline Co., United Gas Bldg., Houston, Tex., Owner Builds, **$888,000, 22.37 mi. 24 in.** GAS LINE, between Magnet-Withers & Missouri City, TEXAS. CD 7/31/50.

† **John J. Stokes Constr. Co.**, P.O. Box 629, San Marcos, Tex., LB **$915,950**, remodeling, imprv. 612 units Wherry HOUSING, San Antonio, RANDOLPH AIR FORCE BASE, TEX. U. S. Govt., c/o Base Procurement Office, Bldg. 575, Randolph Air Force Base, San Antonio, Tex. Hesson & May and Shipman Associates, 148 Olmos Drive, San Antonio, Tex., archts.-engrs. BA 3/29/61. CD 3/10/61.

▲ **WYOMING**—State Hy. Comn., State Hy. Dpt. Office Bldg., Cheyenne, ROADS,

Wyo.—**Big Horn Constr. Co.**, Box 917, Sheridan, Wyo., CA **$1,053,112**, (7 bidders), cement treated base, plant mixed surf., cover aggreg. seal, 12.323 mi. east bound two lanes of 4-lane divided interstate hy., grading surf. one structural plate pipe installation, on approach to project and US 16, 14 intersection all between Buffalo and Gillette from approx. 1 mi. west of Gillette, FAI Proj. I 90-3(12) 117 FAP Proj. F 00802(3) Campbell Co.; CA **$427,008**, (6 bidders, grading, crushed base, plant mixed surf., cover aggreg. seal, three structural plate culvert installations, 6.805 mi. between Upton and Sundance from approx. 5.5 mi. north of Upton, FAS Proj. S 0600(2), Section 1, Weston Co.;

Wyo.—**Taggart Constr. Co.**, Cody, Wyo., CA **$190,291**, (8 bidders), grading, misc. work 8.693 mi. on 2-lanes of 4-lane divided interstate hy. between Rock Springs and Rawlins from approx. 0.5 mi. west of Creston Junction east, FAI Proj. I 80-3(15)190, Sweetwater Co.;

Wyo.—**Boatright-Smith Constr. Co.**, Casper, Wyo., CA **$162,015**, (7 bidders) grading, sub-base, crushed base, plant mixed surf., cover aggreg. seal, curb and gutter, storm sewer system 0.094 mi. on Douglas-Glenrock Rd. (Glenrock Sts.) from approx. 0.094 mi. west of Glenrock east, FAP Proj. F 003-3(7) Converse Co.

Wyo.—**Gilpatrick Constr. Co.**, Box 793, Riverton, Wyo., CA **$695,752**, (10 bidders), grading, crushed base, plant mixed surf., cover aggreg. seal coat, two long span steel pipe, Type IV, 7.52 mi. Lander-Diversion Dam Rd. from Lander northwest, FAS Proj. S-0702 (5) Fremont Co.;

Wyo.—**Knisley-Moore Co.**, Douglas, Wyo., CA **$285,740**, (3 bidders), grading, sub-base, crushed base, plant mixed surf. cover aggreg. seal, one concrete box culvert, two triple concrete box culverts, 5.234 mi. Yoder-East and Yoder Junction, East road from Yoder east, Proj. S 0801(2), S 0811(2) Goshen Co.;

Wyo.—**Lewis E. Yeik**, Torrington, Wyo., CA **$157,501** (5 bidders) grading, sub-base, crushed base, surf. treatment (inverted penetration) three structural plate culvert installations, 3.07 mi. Manville South Rd. from 9.7 mi. south of Manville southwest FAS Proj. S 1400(4), Niobrara Co. Grand total $3,199,005. BA 3/28/61. CD 3/13/61.

COLORADO—State Hy. Dpt., 4201 East Arkansas Ave., Denver, ROAD,

Siegrist Constr. Co., 6000 North York St., Denver, Colo., CA **$740,575**, est. $666,000, (8 bidders), grading, structures, plant mixed asphaltic surfacing, approx. 3.630 mi. Proj. F 022-2(19), La Plata Co., BA 3/29/61, CA 3/29/61. CD 3/13/61.

▲ **B. H. Baker, Inc.**, 2605 N. Circle Dr., Colorado Springs, Colo., LB **$2,333,360**, est. $2,000,000, (8 bidders), STADIUM, Air Force Academy, COLORADO SPRINGS, COLO. Air Force Academy Foundation, First National Bank Bldg., Colorado Springs, Colo. BA 3/29/61. CD 3/13/61.

▲ **NEW MEXICO**—State Hy. Dpt., State Bldg., Cerrillos Rd., Santa Fe, Bids opened 3/31, ROADS,

N. M.—**Wylie Bros. Constr. Co.**, 6511 Domingo Rd. N. E., Albuquerque, N. M., CA **$1,392,981**, est. $1,892,237, constr. two lane cement treated base, conc. prt., base course, asphalt shoulders, frontage roads and ramps, plans mix surf., curb and gutter, signing and misc. constr., 13.98 mi. located 4 mi. north of Anthony North, Federal Aid Proj. No. I-010-2(12), Dona Ana Co.;

N. M.—**Wayne A. Lowdermilk**, P. O. Box 1165, Espanola, N. M., CA **$1,413,607**, est. $1,249,549, constr. four-lane, Southend-prime coat, binder course, base course, plant mix, bit. surf. shoulder treatment, plant, curb and gutter, 6.17 mi. Federal Aid Proj. No. I-025-6(4)448, Colfax Co. CD 3/15/61.

▲† **Dallas Building, Inc.**, P.O. Box 17147, Dallas, Tex., CA **$1,008,889**, NUCLEAR WARFARE LABORATORY, Kirtland Air Force Base, ENG-29-005-61-59B, ALBUQUERQUE, N. M. U. S. Eng., P.O. Box 1538, Albuquerque, N. M. BA 3/22/61. CD 2/16/61.

BUILDINGS—LB & CA

▲ **Bor-Son Constr., Inc.**, 7700 Logan Ave. S., Minneapolis, Minn., LB **$1,184,000**, (4 bidders), MARRIED STUDENTS HOUSING, Phase 3, University of Minnesota, St. Paul Campus, ST. PAUL, MINN. University

of Minnesota, 404 Administration Bldg., Minneapolis 14, Minn. BA 3/30. CD 3/15/61.

Arthur H. Neumann & Bros., 514 Hubbell Bldg., Des Moines 9, Iowa, LB **$815,740,** (4 bidders), general contract Roosevelt High SCHOOL ADDN., DES MOINES, IOWA. Bd. Educ., 1860 Grand, Des Moines, Iowa. Atherton-Dean-Herbert, Karl Keffer Assoc., 202 Masonic Temple Bldg., Des Moines 9, Iowa. BA 3/28/61. CD 8/18/60.

▲† **Henkel Constr. Co.**, 307 Boyce-Greely Bldg., Sioux Falls, S. D., CA **$1,138,400,** two 300 pupil DORMITORIES on Campus of Flandreau Indian School, FLANDREAU, S. D. Bureau Indian Affairs, Dpt. Interior, 933 San Pedro Dr., SE, Albuquerque, N. M. BA 3/14/61. CD 2/15/61.

▲† **Base Procurement Office**, Orffutt Air Force Base, Fort Crook, Neb., cancelled bids to have been opened Apr. 6, 500 Capehart Act Family DWELLINGS, IFB-25-600-61-70, FORT CROOK, NEB. **$8,000,000.** CD 3/22/61.

▲ **J. E. Dunn Constr. Co.**, 929 Holmes, Kansas City, Mo., LB **$3,575,000,** 1, 2 & 3 story, rein.-con. frame, structural steel Shawnee-Mission West HIGH SCHOOL, Overland Park, MISSION, KAN. - Shawnee-Mission High School Dist., 7401 Johnson Dr., Shawnee-Mission, Kan. BA 3/30. CD 3/14/61.

Great Southwest Corp., 3417 Gillespie St., Dallas, Tex., Owner Builds, **$975,000,** 1 story, 185,000 sq. ft., steel frame, concrete floors, WAREHOUSE, ARLINGTON, TEX. General Foods Corp., lessee. Beran & Shelmire, 1900 Vaughn Bldg., Dallas, Tex., archts. CD 5/3/57.

▲ **Barry & Bateson Co.**, c/o owner, CA **$2,750,000,** 12 story, fireproof APARTMENT, 3700 Turtle Creek Drive, DALLAS, TEX. Wm. H. Morris & Associates, 909 S. Boston St., Tulsa, Okla.

† **R. D. Lowman Co., General Contractors**, P. O. Box 1813, El Paso, Tex., CA **$755,491,** BACHELOR OFFICERS QUARTERS, 140-men, EL PASO, TEX. U. S. Eng., P. O. Box 1538, Albuquerque, N. M. BA 3/14/61. CD 3/22/61, under LB.

▲ **Thomas S. Byrne, Inc.**, 1307 Fort Worth National Bank Bldg., Fort Worth, Tex., CA Approx. **$7,500,000,** 1 story, 1,000,000 sq. ft., brick, tile, concrete, steel, Seminary South Regional SHOPPING CENTER, FORT WORTH, TEX. Sears, Roebuck & Co., 925 S. Homan, Chicago, Ill. BA 3/14/61. CD 3/9/61.

International Constr. Co., 2421 W. Holcombe St., Houston, Tex., CA **$578,100,** 6 bldg., 70 unit, APARTMENT, HOUSTON, TEX. Rungmeade Corp., c/o W. W. Crochet, archt., 2421 W. Holcombe Blvd., Houston, Tex. CD 4/4/61.

▲ **H. A. Lott, Inc.**, Box 25005, Houston, Tex., CA **$2,012,012,** est. $1,900,000, SENIOR HIGH SCHOOL, West Lamar, HOUSTON, TEX. Houston Ind. School Dist., 1300 Capitol Ave., Houston, Tex. BA 3/21/61. CD 2/24/61.

▲ **Nelse Mortensen, Inc.**, 1021 W. Lake Ave., Seattle, Wash., LB **$3,281,416,** 200 unit CAPEHART HOUSING NO. 3, Glasgow Air Force Base, GLASGOW, MONT. Base Procurement Office, P.O. Box 5000, Glasgow, Mont. BA 3/28/61. CD 3/16/61.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., San Diego**—BA 4/26—City, Purchasing Agent, Rm. 161, Civic Center Bldg., Zone 1, Chollas OPERATION STATION, incl. undercrane sys., hoist, service station equipt. Over $1,000,000. Plans deposit $10.

† **Ariz., Flagstaff**—BA 5/2—Dist. P. Wks., 11th Naval Dist., 1220 Pacific Hy., San Diego 1, Calif., constr. 60 in. ASTROMETRIC REFLECTOR OBSERVATORY BLDG., Spec. No. 36821. $500,000-$1,000,000. CD 8/18/60.

BUILDINGS—BA

▲ **Calif., Richmond**—BA 4/26—Safeway Stores, Inc., Industrial Div., 4 and Madison Sts., Oakland, DISTRIBUTION CENTER, incl. 40,000 ft. frozen food warehouse; 175,000 sq. ft. perishable goods warehouse; 94,000 sq. ft. bakery; 4,800 ft. administration bldg., 8,500 ft. box shed, Hoffman Blvd. and South 15 St. $2,050,000. Bonelli & Wong, 580 Market St., San Francisco, Calif., archts.-engrs. CD 10/27/60.

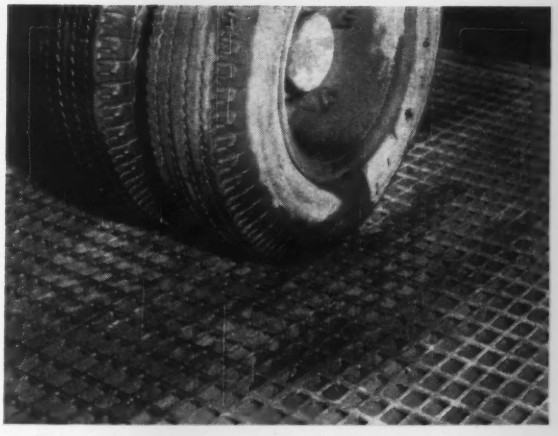
HEAVY CONSTRUCTION—LB & CA

▲† **Wals & Co.**, Box 4488, Spenard, Alaska and RIVERS CONSTR. CO., Fairbanks, Alaska, LB **$1,693,394,** (8 bidders) APPROACH LANDING SYS. extend runway and aprons, imprv. aircraft control facilities, Inv. 61-48, COLD BAY, ALASKA. Federal Aviation Agency, 225 2 Ave., Anchorage, Alaska. BA 3/24. CD 2/17/61.

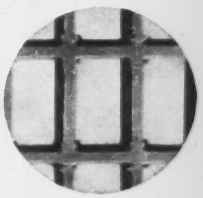
▲ **Vinnell Corp.**, 1145 Westminster Ave., Alhambra, Calif., CA Est. **$3,500,000,** 38 mi. single track RAILROAD from Abra to Skull Valley, ARIZONA, Atchison, Topeka & Santa Fe Railroad, 121 E. 6 St., Los Angeles 14, Calif. CD 5/15/59.

▲ **ARIZONA**—State Hy. Dpt., 206 S. 17th Ave., Phoenix, ROADS.

The Ashton Co., Inc., P.O. Box 7065, Tucson, Ariz., CA **$2,480,659,** grading, select material, aggregate base, b. conc. emuls fied asphalt seal coat, construct four 3 span rein.-con. slab overpasses, Proj. I-10-6 (18)368, beginning about 3 mi. east Bowie on State Rte. 86, extending southeasterly over new alignment State Rte. 86, approx. 4 mi. toward San Simon, Proj. I 10-6(25)372, beginning east end Proj. I



Heavy mobile loadings call for Gary HEAVY-WELD STEEL GRATING



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ROCKWELL-STANDARD CORPORATION

Grating Division, Gary, Indiana

10-6(18)368 extending southeasterly over new alignment State Rte. 86 approx. 4.2 mi. toward San Simon. Item No. 208, AFE 8686, Benson-Steins Pass Hy., Cochise Co.; CA **$1,173,880**, grading, select material, aggregate base, b. conc. emulsified asphalt seal coat, construction four 3-span rein.-con. slab overpass structures, one 2 span steel girder pedestrian overpass structure, beginning Aztec on U. S. Rte. 80 extending northeasterly over U. S. 80 to Yuma Maricopa Co. line approx. 7 1/3 mi. I 8-1(8)73, Yuma Casa Grande Highway, Yuma Co., BA 3/17/61, CA 3/28/61. CD 3/22/61, under LB.

▲ **ARIZONA**—State Hy. Dpt., 206 S. 17th Ave., Phoenix, Bids opened 3/30, ROADS.

Ariz.—**San Xavier Rock & Sand Co.**, P.O. Box 1031, Tucson, Ariz., LB **$1,227,773**, est. $1,361,168, (7 bidders), widening westbound roadway approx. 4.2 mi., constr. westbound roadway approx. 319 mi. incl. grading, select material, aggregate base, b. conc, emulsified asphalt seal coat, constr. 3 interchange structures beginning approx. 11 mi. southeast Tucson and extending southeasterly over U. S. Rte. 80 approx. 8 mi. toward Benson, Pima Co.;

Ariz.—**W. R. Skousen, Contractor**, P. O. Box 71, Mesa, Ariz., LB **$274,418**, est. $281,015, (6 bidders), widening existing roadway, incl. grading, furnishing placing select material, aggregate base, b. conc. furnishing, applying emulsified asphalt seal coat, beginning approx. 6½ mi. south Coolidge, La Palma, extending south over State Rte. 87 approx. 5 mi. toward Picacho, F. 019-1(13). Item No. 211, AFE 8728, M. P. 125.90, 120.96, Picacho-Florence Jct. Hy. Pinal Co. CD 3/14/61.

▲ **WASHINGTON**—State Hy. Comn., Transportation Bldg., Olympia, ROAD.

Sound Constr. & Engineering Co., 1300 Aloha St., Seattle, Wash., CA **$5,548,321**, grading, surf. cement concrete paving, retaining wall, rein.-con. tunnel four rein.-con. box girder bridges, rein.-con. T beam bridges, rein.-con. special bridge, adjusting utilities, fencing, installing illumination on 0.466 mi. Primary State Hy. 1, Seattle Freeway, Oliver Way to Republican St., FA EBI 5-3(112)166, King Co. BA 3/28/61, CA 3/29/61. CD 3/30/61, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles. Bids opened 3/30, ROAD.

Fredericksen & Kasler, 212 13 St., Sacramento, Calif., and **Gordon H. Ball**, 300 Camille Ave., Danville, Calif., LB **$7,946,638**, (3 bidders), grading, paving 5.2 mi. six lane freeway on US Hy. 70-99 between Colton Ave. and 0.9 mi. east of Wabash Ave., San Bernardino Co. CD 2/23/61.

† **Lawrence Constr. Co.**, 3020 V St., Sacramento, Calif., CA **$977,687**, POWER and RELAY BLDGS. ADDN., West Coast Relay and Radio Transmitting Station, near Davis, Yolo Co. Spec. 2687A, ENG-04-167-61-42, CALIFORNIA. U. S. Eng., 1209 8 St., Sacramento, Calif. BA 3/23, CA 3/24. CD 3/30/61, under LB.

▲ **Madonna Constr. Co.**, P.O. Box 910, San Luis Obispo, Calif., CA **$1,437,505**, HERNANDES DAM, 120 ft. high, 1,400 ft. long, 18,000 acre storage, earthfill, concrete chute spillway, PL 984 near Hollister, CALIFORNIA. San Benito Co. Water Conservation & Flood Control Dist., 3220 Southside Rd., Hollister, Calif. BA 3/15. CD 3/23/61, under LB.

Ince Bros. Pipeline Constr. Co., 625 E. Taylor St., Sunnyvale, Calif., LB **$921,561**, est. $1,022,540 (7 bidders) Phase I, SANITARY SEWER IMPRVS., BAKERSFIELD, CALIF. East Niles Community Services Dist., 1417 Vale St., Bakersfield, Calif. Boyle Engineering Co., 1601 "H" St., Bakersfield, Calif., engr. BA 3/27. CD 3/7/61.

▲ **O. K. Mittry & Sons**, 15905 So. Broadway, Gardena, Calif., LB **$1,849,325**, (6 bidders), CHET HARRITT DAM, LA MESA, CALIF. Helix Irrigation Dist., 8111 University Ave., La Mesa, Calif. BA 3/28. CD 3/20/61.

Charles L. Harney, 575 Berry St., San Francisco, Calif., CA **$882,433**, GEARY EXPRESSWAY from Masonic Ave. to Steiner; Webster to Franklin Sts., SAN FRANCISCO, CALIF. City and San Francisco Co., Dir. P. Wks., City Hall, San Francisco, Calif. CD 3/29/61, under LB.

▲ **Hood Corp.**, 8201 Sorenson Ave., Box 2167, Whittier, Calif., CA **$1,784,000**, Malibu-Topanga Feeder WATER MAIN, Unit 2, Proj. No. WWD-29-2, Malibu, LOS ANGELES, CALIF. Los Angeles County Water Works Dist. No. 29, Hall of Administration, Los Angeles, Calif. BA 3/20, CA 3/28. CD 3/24/61, under LB.

BUILDINGS—LB & CA

Industrial & Commercial Constr. Co., Box 4, Fairbanks, Alaska, LB **$744,365**, (5 bidders), rein.-con. FIRE HEADQUARTERS, FAIRBANKS, ALASKA. City, City Hall, Fairbanks, Alaska. BA 3/24. CD 3/10/61.

▲† **Kaufman & Broad Building Co.**, 18610 W. 8th Mile, Southfields, Mich., LB **$4,778,845** base bid, LB **$3,095,033**, 200 units LB **$1,683,812**, 100 units, CAPEHART HOUSING, ENG-04-454-61-46, Proj. 123-81914 Army No. 7, FORT HUACHUCA, ARIZ. U. S. Eng., 751 South Figueroa St., Los Angeles, Calif. BA 3/30/61, CA 3/8/61;
J. W. Bateson Constr. Co., Inc., 10130 Monroe Dr., Dallas, Tex., LB **$4,852,139** base bid, LB **$3,230,975** on 200 units, LB **$1,621,164** on 100 units, CAPEHART HOUSING, (Fort Huachuca, Ariz.).

F. Dunham, 2630 West Bruneau Ave., Kennewick, Wash. Owner Builds, **$750,000**, 50-unit APARTMENT, KENNEWICK, WASH. CD 8/11/59.

Zoellner Constr. Co., Ivy Dr., Ross, Calif., CA **$743,369**, 1 story, 29,400 sq. ft. brick OFFICE, Fifer Industrial Park, CORTE MADERA, CALIF. Marin Municipal Water Dist., 874 4 St., San Rafael, Calif. BA 3/8. CD 3/16/61, under LB.

Carriage Constr. Co., 119 Cabrillo, Costa Mesa, Calif., CA **$977,050**, 38 frame stucco DWELLINGS, 1869 Tahiti Dr., COSTA MESA, CALIF. Carriage Ranchos Inc., 119 Cabrillo, Costa Mesa, Calif.

▲ **Erickson Constr. Co.**, 977 Arden Way, Sacramento, Calif., CA **$1,484,826**, rein.-con., structural steel, etc., PHYSICAL SCIENCES, Unit No. 1, 4 bldgs., DAVIS, CALIF. Regents of University of California, c/o Office of Architects and Engineers, A & E Bldg., University of California, Davis, Calif. CD 3/16/61, under LB.

▲ **Tom E. Norcross, Inc.**, 6053 Atlantic Ave., Long Beach, Calif., LB **$5,157,000**, (5 bidders), Womens' JAIL at Biscailuz Center, Monterey Park, LOS ANGELES, CALIF. Bd. Supervs. Los Angeles County, Hall of Records, Los Angeles, Calif. BA 3/29, CD 2/13/61;
Herrick Iron Works, Hayward, Calif., LB **$434,700**, JAIL EQUIPMENT, Biscaluiz Center, (Los Angeles, Calif.).

▲ **Barrett Constr. Co.**, 1800 Evans Ave., San Francisco, Calif., LB **$1,972,000**, (9 bidders), 5 story, 63,000 sq. ft. 125-bed Marin General HOSPITAL, near SAN RAFAEL, CALIF. Marin County Hospital Dist., Bd. Dirs., San Rafael, Calif. Robert Stanton, P.O. Box 2177, Carmel, Calif., archt. M. D. Perkins, 216 Alvarado Rd., Berkeley, Calif., engr. BA 3/28. CD 6/13/60.

▲ **Nomellino Constr. Co.**, P.O. Box 1528, Stockton, Calif., CA **$2,278,000**, Conway Homes Annex, Proj. 24-6, 200 frame, stucco DWELLINGS, STOCKTON, CALIF. Housing Authority of San Joaquin, 2436 S. Belleview Ave., Stockton, Calif. BA 3/16. CD 3/23/61, under LB.

▲ **R. H. Grant & Co.**, 1665 S. Brookhurst, Anaheim, Calif., Owner Builds, **$1,890,000**, 189 DWELLINGS, Tract 3859, WESTMINSTER, CALIF. Earl G. Kaltenback, Jr., 9772 Katella Ave., Anaheim, Calif., archt.

▲ **Hawaiian Dredging & Constr. Co.**, 1350 Ala Moana Blvd., Honolulu, Hawaii, CA Est. **$16,000,000**, 27 story APARTMENT, 2 level PARKING, MALL for SHOPS, SWIMMING POOL, WAIKIKI, HAWAII. Chinn Ho Investment Co. and Latipac International, 850 Richards St., Honolulu, Hawaii. John Graham, 1441 Kapiolani Blvd., Honolulu, Hawaii, archt. CA 2/61. CD 7/18/60.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Ont., Toronto**—BA 4/25—Toronto Harbor Comrs., 60 Harbour St., 210x660 ft. MARINE TERMINAL No. 1,

(Continued on page 161)

MANITOWOC SECTIONAL BARGES

■ SUPPORT CRANE AND BATCHING PLANT

■ ARE TOWED WITH EQUIPMENT OVER 100 MILES

Versatile Manitowoc Sectional Barges provided a "floating concrete plant" during recent construction of a "port of refuge" at Big Bay, Michigan. Grouting mixed on the spot was poured over rip-rap in cells forming the breakwater.

The Manitowoc Type H Sectional Barge pictured measures 80' x 30' x 6' and is comprised of seven individual sections, firmly bolted together to form an ample, seaworthy platform for a Manitowoc 20 ton Crane, bins, the mixer and miscellaneous equipment. The barge sections were trucked to Hancock, Michigan, and the assembled barge with equipment shown was towed over 100 miles, via Lake Superior, to the job site.

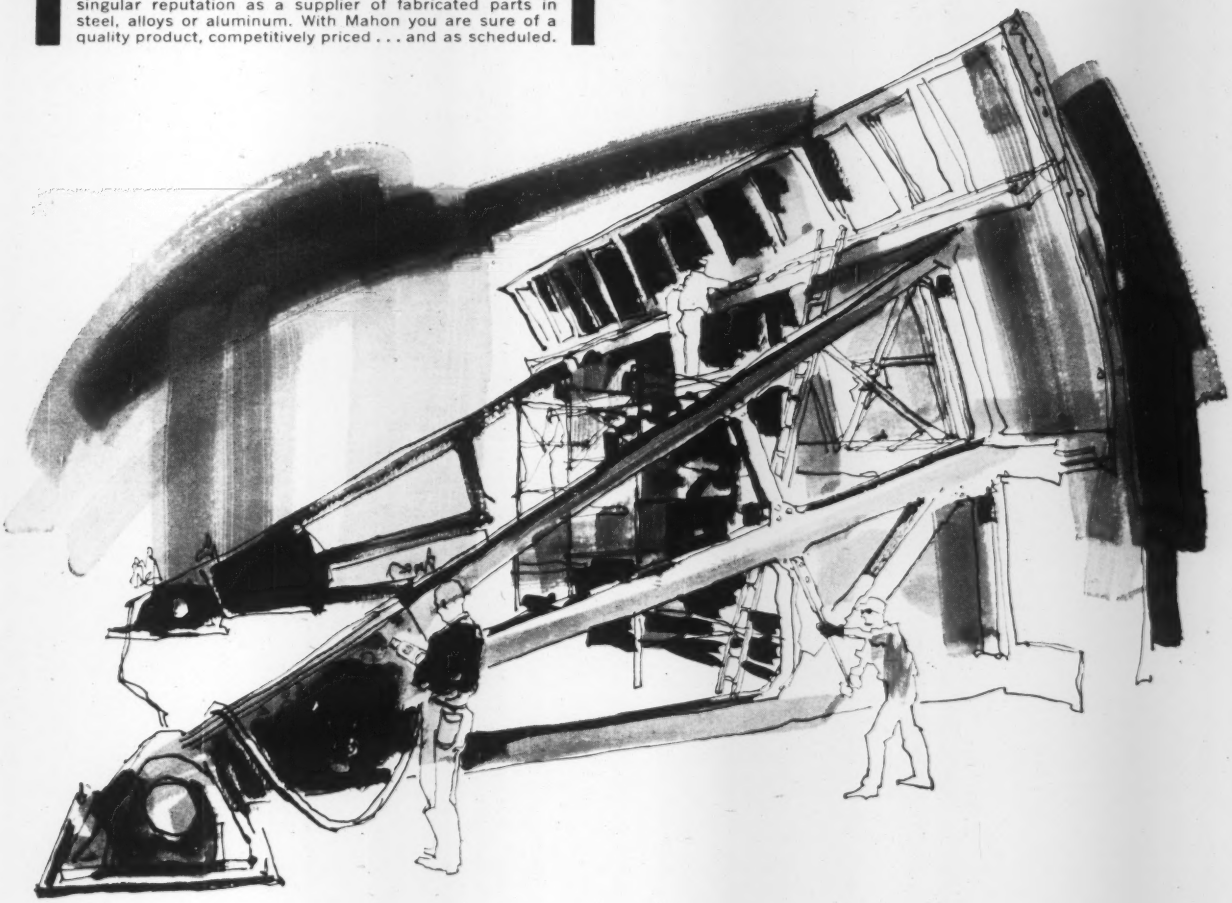
Manitowoc Sectional Barges are quickly assembled and taken apart . . . can be shipped by truck or rail. Separate sections — in two basic sizes — plus a variety of optional equipment, make any size, shape, or type of barge possible. For full information contact your Manitowoc distributor or write direct.

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

Old-time craftsmanship backed by extensive modern facilities (as shown in part) is the reason for Mahon's singular reputation as a supplier of fabricated parts in steel, alloys or aluminum. With Mahon you are sure of a quality product, competitively priced . . . and as scheduled.

MEN WHO KNOW FACILITIES, CAPACITY AND **QUALITY**— INSIST ON . . .

"fabrication by Mahon"



When quality and precision comes first—as with this 25 x 35-ft. heavy steel Tainter Gate for a flood-control dam at Waterbury, Vermont—the source should be Mahon . . . where fabrication is an art. Whether your work is mechanical or structural . . . a one-time design or a production run involving welding, machining or assembling . . . Mahon's Steel-Weld Division provides an unbeatable *single-source-service.* And the wealth of Mahon experience is yours to tap at no extra cost. Let us prove why . . . you too . . . should specify "fabrication by Mahon."

THE R. C. MAHON COMPANY • DETROIT 34, MICHIGAN

Manufacturing Plants—Detroit, Michigan and Torrance, California

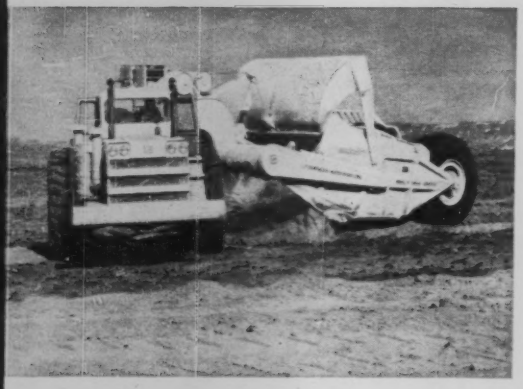
WRITE TODAY FOR STEEL-WELD LITERATURE . . . OR FOR ON-THE-SPOT HELP DISCUSS YOUR PROBLEM WITH A MAHON FABRICATION ENGINEER.

MAHON

There's an LW 'Pull* to fit every job

LW TANDEMS

With exclusive electric-control system you can use two scrapers behind *any* LeTourneau-Westinghouse Tournapull® or Speedpull® prime-mover . . . double your load capacity at only 30% extra cost! Plug-in jacks, swivel hitch let you add or take off second scraper in minutes. Tandem scraper capacities: 18 to 58 heaped yds.



LW V-POWER B 'PULL

Puts more production, new profits into big-scraper dirt-moving with: More power . . . 430 hp. New speed . . . up to 28.3 mph. New capacity . . . 23 yds struck, 29 yds heaped . . . 58 yds in tandem.

LW V-POWER "C"

Standard of the industry. 290 hp, best power/wt ratio of any single engine scraper in its class. 20-yd heaped, 14-yd struck Fullpak® scraper. 27 mph. Most fully job-proved scraper on the market!

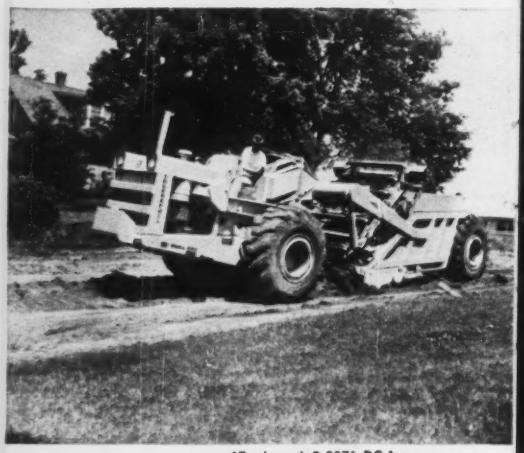
LW SPEEDPULL

For top-performance on long-haul assignments. 276 hp, 20-yd heaped capacity, 37.7 mph, exclusive Hydrair® suspension, best power-to-weight ratio, many other advantages.

LW D TOURNAPULL

Money-maker on any size job with standard 9-yd LW scraper . . . or with 10-yd Hancock elevating scraper (shown). 143 hp . . . choice of constant-mesh or torque-converter transmission . . . speeds up to 30 mph. Permit-free roadability.

See us for complete details and demonstration.



*Trademark P-2371-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

(Continued from page 158)

about 139,000 sq. ft. guard house, paving, sewer, water services, east end of Toronto Harbor, $1,500,000. CD 3/10/61.

HEAVY CONSTRUCTION—LB & CA

▲ **ALBERTA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Bids opened 3/23, ROAD.

Dawson Wade & Co., Ltd., 775 Clark St., Vancouver, B. C., LB **$1,446,552** (9 bidders), grading, paving culverts, base course, prime and double seal from Mile 105.5 to Mile 115 on Banff-Jasper Hy., Jasper National Park, Banff. CD 3/10/61.

Dawson Wade & Co., Ltd. & Peter Kiewit Sons Co. of Canada Ltd., 775 Clark Dr., Vancouver, B. C., LB **$805,881**, two SNOW SHEDS, Trans Canada Hy., GLACIER PARK, B. C. Dpt. P. Wks., Parliament Bldgs., Ottawa, Ont. BA 3/2/61.

ONTARIO—Dpt. Hys., Parliament Bldgs., Downsview, ROAD.

Dufferin Constr. Co., Ltd. & Associated Quarries Constr. Co., Ltd., 2700 Dufferin St., Toronto, Ont., CA **$923,010**, grading, granular base, concrete base, hot mix paving, 4 mi., 6 lanes Queen Elizabeth Way from Hy. 27 to Hy. 10, Toronto. BA 3/22. CA 3/24/61. CD 3/29/61, under LB.

▲ **J. A. Jones Constr. Co. (Canada) Ltd.**, 277 Slater St., Ottawa, Ont., CA **$3,775,000**, SEWERAGE PROJECT, incl. main bldg., marine outlet sewer, elevated water tower fdn., raw water pumping station, South Bank Ottawa River, OTTAWA, ONT. City, City Hall, Ottawa, Ont. CA 3/27/61. CD 3/23/61, under LB.

Atlas Constr. Co., Ltd., 4781 Ste. Catherine St. W., Montreal, Que., CA, **(a)** 50 x 323 ft. OIL DOCK, on steel piles at maritime terminal, SEVEN ISLANDS, QUE. Imperial Oil Ltd., 1900 Sherbrooke St. W., Montreal, Que. Total est. **$800,000.** BA 3/14/61. CD 3/9/61.

Gulf Maritime Constr. Ltd., 50 Soucy St., Matane, Que., CA, **(b)** 500 ft. CAUSEWAY, incl. approx. 112,000 cu. yd. rock fill, Marine Terminal (Seven Islands, Que.).

McNamara (Quebec) Ltd., 3901 Jean Talon St. W., Montreal, Que., CA **(c)** DREDGING approx. 50,000 cu. yd. material in St. Lawrence River at Marine Terminal (Seven Islands).

Simard & Freres Cie Ltee, 3033 Jarry St. E., Montreal, Que., CA **$723,930**, 14 mi. ROAD to Manicouagan Hydroelectric project, Site No. 2, Manicouagan, QUEBEC, Quebec Hydro Electric Comn., 107 Craig St. W., Montreal, Que. BA 3/9/61, CA 3/28/61. CD 3/15/61, under LB.

YUKON TERRITORY—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Bids opened 3/23, ROAD.

General Constr. Co., Ltd., Granville Island, Vancouver, B. C., LB **$568,844** (6 bidders), grading, culverts, bridges mile 34.8 to Mile 68.8 Watson Lake northerly development road, Watson Lake. CD 3/10/61.

BUILDINGS—LB & CA

F. Stanzl Constr. Co., 453 E. 59 Ave., Vancouver, B. C., CA **$700,000**, 2 story, approx. 16,000 sq. ft. rein.-con. BOWLING ALLEY, VANCOUVER, B. C. Street Railwaymens Cooperative Society, 100 block E 7th St., Vancouver, B. C. Duncan S. McNab & Assocs., 1089 W. Broadway, Vancouver, B. C., archt. CA 3/29/61.

▲ **Canadian Engineering & Contracting Co., Ltd.**, 25 Hughson St. S., Hamilton, Ont., CA Est. **$1,000,000**, superstructure MFG. PLANT, Beach Rd. and Parkdale Ave., HAMILTON, ONT. Columbian Carbon (Canada) Ltd., 7147 Park Ave., Montreal, Que. BA 1/30/61. CD 1/31/61.

▲ **Allfield Investments Ltd.**, 58 Wigmore Dr., Scarborough, Ont., Owner Builds, **$1,130,000**, 4 story, brick APARTMENT, Culford Rd., TORONTO, ONT. G. Ankowica, 65 Peace Dr., Scarborough, Ont., archt.

▲ **J. L. Guay Ltee**, 6900 Cote des Neiges Rd., Montreal, Que., LB **$2,012,627**, modernizing CITY HALL ANNEX, Gosford St., MONTREAL, QUE. City, City Hall, Montreal, Que. BA 3/29/61. CD 3/9/61.

▲ **Foundation Co. of Canada Ltd.**, 1900 Sherbrooke St. W., Montreal, Que., CA Est. abt. **$3,000,000** (12 bidders), 2 story, approx. 12,000 sq. ft. CAFETERIA and DINING HALL, two 7 story, 48 x 179 ft., brick, stone MEN'S RESIDENCE with penthouse, rein.-con. fdns. and structure, McGill campus, MONTREAL, QUE. Bd. Governors, McGill University, Sherbrooke St. W., Montreal, Que. BA 2/28/61. CA 3/28/61. CD 1/31/61.

Roger Desilets, Inc., P.O. Box 18, Nicolet, Que., CA Est. **$950,000**, CATHEDRAL, Brassard St., NICOLET, QUE. Corp. Episcopale Catholique Romaine du Diocesse de Nicolet, Nicolet, Que. Gerard Malouin, 100 St. Jean Baptiste St., Nicolet, Que., archt. Bourgeois & Martineau, 3365 Ridgewood Ave., Montreal, Que., engrs. CD 9/9/60.

PROPOSED PROJECTS

WATER SUPPLY

Ky., Campbellsville—City, City Hall, WATER LINES and 1 m.g. storage tank. **$780,000.** Snyder-McClelland, Hillsboro, Ind., consult. engrs. CD 12/1/60.

▲ **Tex., Houston**—City, Dpt. P. Wks., City Hall, WATER SUPPLY DAM, on Trinity River, near Livingston, **$30,000,000.**

SALT WATER BARRIER, on Trinity River at Wallisville, near Livingston, **$10,000,000.**

WATER PUMPING PLANT, **$1,500,000.** Brown & Root, Inc., 35 Japhet St., consult. engr. CD 1/22/59, under Earthwork.

▲ **Va., Fredericksburg**—City, City Hall, WATER RESERVOIR, **$315,000**; WATER TREATMENT PLANT, **$1,250,000**; RAISING LEVEL of Rappahannock River DAM, **$440,000**; WATER MAINS and PUMPING STATIONS, **$185,000.** Hayes, Seay, Mattern & Mattern, 1615 Franklin Rd. S.W., Roanoke, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Calif., San Bruno and South San Francisco**—City of San Bruno and City of South San Francisco (joint owners), c/o Harry N. Jenks & John H. Jenks, consult. engrs., 545 Byron, Palo Alto, SEWAGE TREATMENT PLANT EXPANSION. **$2,000,000.** CD 5/29/56, under Calif., San Bruno.

Conn., Greene Farms—Town of Westport, Bd. Selectmen, Town Hall, Westport, SEWERAGE SYSTEM to Hillspoint School, Hale and High Sts., Valley and Guyer Rds., Pumping Station. **$750,000.**

Ga., Forest Park—City, City Hall, South Side SANITARY SEWER PROJECT, **$800,000.** CD 4/8/55.

▲ **N. H., Hampton**—Town, Town Hall, Town Office Bldg., SEWERS, northern part of town. **$1,160,000.** Haley & Ward, 73 Tremont St., Boston, Mass., assoc. engrs. John W. Durgin, C.E., 600 Greenland Rd., Portsmouth, consult. engrs. CD 4/11/60.

▲ **O., Navarre**—Village, Village Hall, SEWAGE PLANT IMPRVS., SEWAGE LINE EXTENSIONS. **$1,200,000.** Floyd G. Browne & Assocs., 125 W. Church St., Marion, consult. engrs. CD 7/14/58.

▲ **Va., Portsmouth**—Bd. Supervs. Norfolk Co., 100 County St., voted bonds Mar. 21, LATERAL SEWERAGE LINES, Western Branch Dist., Norfolk Co. **$1,870,000.** Bids late 1961. CD 1/4/61.

STREETS AND ROADS

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4, ROADS.

Mobile Co.—four-lane Airport Blvd. (Grant Street) **$1,500,000.** Bids Summer 1961.

▲ **N. Y., Oyster Bay**—Dpt. Hys., Town Oyster Bay, Town Hall, Audrey Ave., HIGHWAY WORK, to incl. imprvt. Bethpage-Sweet Hollow Rd. (old Motor Parkway) between Round-Swamp Rd. and Winding Rd. (Old Bethpage; paving and imprvt. Brenner Ave. between Beech and Pershing Aves., Bethpage; curbs and resurf. area bounded by Griffin Ave., Whitney Ave., Pinehollow Rd. and Floyd Place, East Norwich; curbs and paving Beach Rd., Massapequa; wid'n., imprvt. Merritts Rd. between Broadway and Long Island RR, South Farmingdale; curbs and regrading area Lenox Ave., E. John St., Broadway and Bethpage Rd., Hicksville; wid'n. and imprvt. Carman's Rd. between Westwood South and Sunrise Hy., West Amityville; wid'n. and imprvt. Broadway between Sunrise Hy. and Massapequa-Hicksville Rd., Massapequa and wid'n., imprvt. Burns Ave., Hicksville. **$1,894,000.** To go ahead 1961 and 1962.

Tex., North Richland Hills (Br. Fort Worth)—City, City Hall, bond election Apr. 15, STREET PAVING and DRAINAGE. **$827,000.**

EARTHWORK, WATERWAYS

▲ **Alaska, Ketchikan**—City, City Hall, rehabilitating WHITMAN DAM, replacing penstock, powerhouse and transmission lines. **$1,283,440.** To go ahead 1962.

▲ **Wash., Edmonds**—Port of Edmonds, BOAT HARBOR and MOORAGE. **$1,300,000.** Bids late April. J. Reid, c/o owner, engr. CD 5/28/57.

▲ **Que., Shawinigan**—Shawinigan Water & Power Co., 600 Dorchester St. W, Montreal, 125,000 kw. HYDRO ELECTRIC PLANT, Rapide des Coeurs, St. Maurice River north of Shawinigan, **$44,000,000.**

UNCLASSIFIED

▲ **Alaska, Ketchikan**—City, City Hall, expansion of ELECTRIC POWER SYS. **$1,300,000.**

▲ **Calif., Sausalito**—Bethel Island Yacht Haven, Inc., 782 Lone Tree Rd., Brentwood & Manuel G. Perez, Rte. 2, Box 378, Oakley, Calif., MARINA, Bethel Island Bridge, incl. 1,400 berths, 41 acre lake, shopping area, bowling alley, market, bank, small shops and boat repair facilities, near here. **$4,500,000.** Hugh M. O'Neil, 610 16 St., Oakland, consult. engr.

▲ **Calif., Vallejo**—City, City Hall, WATERFRONT MARINA, fueling facilities, serevice bldg., swimming pool, two tennis courts. **$1,100,000.** Creegan & D'Angelo, 1046 W. Taylor St., San Jose, consult. engrs. Bids in two months. CD 3/26/59.

N. Y., Buffalo—City, City Hall, FIRE TRAINING TOWER. **$950,000.**

▲ **N. Y., Flushing**—Edward H. Burdick Assos., Inc., 104 E. 40 St., New York, Zone 16, 3 story, 149,920 sq. ft. Better Living Pavilion World's Fair EXHIBITION BLDG. **$6,000,000.**

▲ **N. Y., Flushing**—New York World's Fair 1964-65 Corp., Flushing Meadow Park, P.O. Box 1964, relocating, imprv., enlarging QUEENS BOTANICAL GARDENS, Kissena Corridor Park, incl. administration bldg. $1,000,000. Clarke & Rapuano, 830 3rd Ave., New York, Zone 22, landscape archts. Hopf & Adler, 220 E. 23rd St., New York 10, N. Y., archt. for Administration Bldg. only.

N. Y., Flushing—Restaurant Associates, Inc., 515 W. 57 St., New York, Zone 19, 15 REFRESHMENT STANDS, World's Fair Grounds. **$700,000.**

▲ **O., Cleveland**—City, City Hall, Zone 14, plans by Clarke & Rapuano, 830 3rd Ave., New York, N. Y., MALL PLAZA over underground exhibition hall, incl. large fountain in 100 x 300 ft. pool, **$1,500,000.**

▲ **Oklahoma**—Mustang Fuel Corp., 2901 Classen Blvd., Oklahoma City, 75 mi. 4-12½ in. FUEL LINE, Piedmont to Oakwood, **$1,500,000**; 17 mi. 10½-12½ in. FUEL LINE, Newcastle to Crider, **$425,000.**

▲ **Pa., California**—General State Authority, 18th and Herr Sts., Harrisburg, plans by Michael R. Cozza & Associates, archts.-engrs., 314 Hays Ave., Pittsburgh, Zone 10, GYMNASIUM and 3 story, partial bsmnt., CLASSROOM, incl. offices, classrooms, dressing, shower, locker, **$1,000,000,** swimming pool, **$300,000.** CD 11/10/60.

PUBLIC BUILDINGS

▲ **Ala., Opelika**—Opelika Housing Auth., P. O. Box 786, plans by Biggers, Scarbrough & Neals, 1353 13th Ave., Columbus, Ga., 100 HOUSING UNITS. **$1,000,000.**

Ark., Fayetteville—University of Arkansas, Fayetteville, plans by Mott, Mobley & Horstman, Merchants National Bank, Fort Smith, WOMEN'S DORMITORY, **$940,000.** CD 1/2/58.

▲ **Calif., Sunnyvale**—Fremont Union High School Dist., Box 215, plans by Masten, Hurd & Gwathmey, 526 Powell St., San Francisco, HIGH SCHOOL NO. 4, Homestead Rd. and Mary Ave., Cupertino. **$3,000,000.** CD 5/25/60.

▲ **Colo., Littleton**—School Dist. No. 6, 176 South Grant, plans by Alfred Watts Grant & Assocs., 1640 Court Place, Denver, 1 story, 102,000 sq. ft. JUNIOR HIGH SCHOOL, South University Blvd. and Orchard Ave. **$1,500,000.** CD 12/12/60.

▲ **Conn., Hamden**—Town, Town Hall, HIGH SCHOOL, North End. **$1,000,000.**

▲ **Conn., New Britain**—Town, Bd. Educ., 27 Hillside Place, plans by Hollis W. Kincaid, 945 Asylum Ave., Hartford, New Britain HIGH SCHOOL, RENOVATION, **$2,000,000.** CD 1/17/61.

▲ **Conn., Wethersfield**—State P. Wks. Dpt., 165 Capitol Ave., Hartford, COMMUNITY CENTER for mentally retarded, Jordan Lane. **$3,000,000.**

▲ **Ga., Athens**—BD. Regents, University System of Georgia, 244 Washington St., SW, Atlanta, plans by Logan & Williams, Palmer Bldg., Atlanta, 9 story, DORMITORY, incl. dining hall, at University of Georgia. **$3,600,000.** CD 12/23/57.

▲ **Ga., East Point**—South Fulton Hospital Auth., 114 S. East Point St., plans by Abreu & Robeson, Inc., 141 Walton St. N.W., Atlanta, 5 story, 100,000 sq. ft. 150 bed South Fulton HOSPITAL. **$3,000,000.** Harry Hunter, Candler Bldg., Atlanta, Ga., struct. engr. Newcomb & Boyd, 1205 Spring St., NW, and Bush-May & Assocs., 26 Peachtree Place, NW, Atlanta, Ga., mech. engrs. CD 1/6/61.

▲ **Ga., Savannah**—Chatham County Bd. Educ., 208 Bull St., plans by Thomas, Driscoll & Hutton, 20 E. Bay St., 3 JUNIOR HIGH SCHOOLS. **$1,500,000.**

▲ **Ga., Waynesboro**—Waynesboro Housing Auth., P.O. Box 351, plans by George N. Javo & Assocs., 881 Peachtree Bldg., Atlanta, 150 low rent HOUSING UNITS. **$1,500,000.**

▲ **Ill., Granite City**—Granite City Housing Authority, 1200 Kirkpatrick Homes, plans by Gabriel & Duigeroff, 1839 Delmar, HOUSING FOR ELDERLY PERSONS, 2800 block of Edwards St., over **$1,000,000.** Bids June 1, 1961. CD 2/29/60.

▲ **Ind., Gary**—City, City Hall, plans by Beine Hall & Curran, Inc., 607 Broadway, LIBRARY 5th and Adams Sts. **$2,000,000.** CD 12/10/58.

▲ **Iowa, Humboldt**—Humboldt Community School Dist., voted $1,324,000 bonds, SENIOR HIGH SCHOOL, **$1,000,000.** Smith, Voorhees, Jensen, Architects Associates, Davidson Bldg., Des Moines 9, Iowa, archts. Bids about 6/1/61.

▲ **Md., Salisbury**—Wicomico Bd. Educ., JUNIOR HIGH SCHOOL. **$1,500,000.** Bids Summer 1961.

Mass., Harvard—Town, Supt. Schools, JUNIOR-SENIOR HIGH SCHOOL, Massachusetts Ave. **$800,000.** Bids July 1961.

▲ **Mass., Sharon**—Town, School Dpt., South Main St., SENIOR HIGH SCHOOL, 180 Pond St. **$1,000,000.** Bids June 1961.

▲ **Mich., Jackson**—Jackson Co. Dpt. Social Welfare, 410 E. Ganson St., plans by Commonwealth Assocs., Inc., 209 E. Washington, Jackson, Mich., HOSPITAL. **$1,750,000.** Bids about June 20. CD 2/26/53.

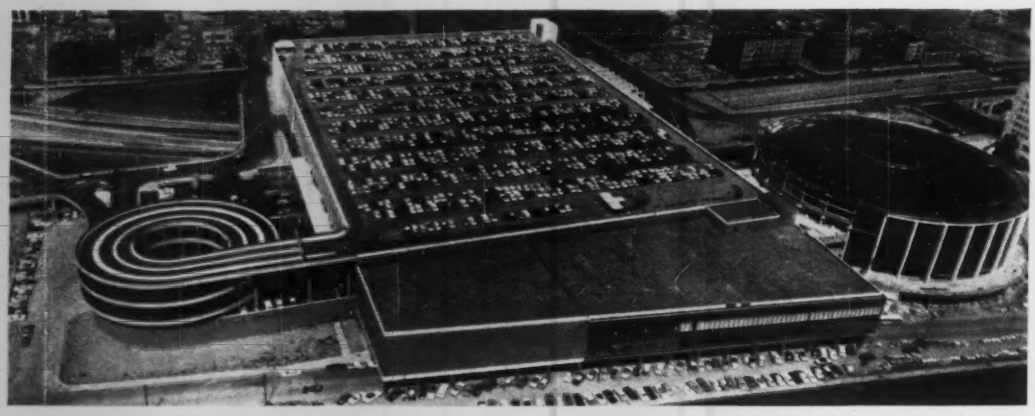
▲ **Mich., Warren Woods**—Warren Woods School Dist., Warren Woods, voted bonds Mar. 13, HIGH SCHOOL and two ELEMENTARY SCHOOLS ADDN. **$3,560,000.**

▲ **Minn., Minnetonka**—Bd. Educ. Independent School Dist., No. 276, defeated $4,000,000 bonds Mar. 21, JUNIOR HIGH SCHOOL ADDN., **$2,401,000,** SENIOR HIGH SCHOOL, **$1,189,000.** CD 2/1/61.

▲ **Mo., Kansas City**—Center School Dist., 84 and Euclid, voted **$1,500,000** bonds Mar. 14, Urick, rein.-con. steel JUNIOR HIGH SCHOOL. Marshall & Brown, 1016 Baltimore, Kansas City, Mo., archts. Bids Sept. 1961. CD 1/26/61.

▲ **Mo., North Kansas City**—North Kansas City, School Bd., 2000 E. 46 St., North, Zone 16, plans by Kivett, Myers & McCallum, 1016 Baltimore, Kansas City, Mo., JUNIOR HIGH SCHOOL. **$1,410,000.** Bids Sept. 1961. CD 2/24/61.

(Continued on page 164)



Cobo Hall covers 10 acres in Detroit's new civic center. It is the world's largest exhibition hall. One area has about 300,000 square feet of exhibit space. National Tube supplied pipe used for air conditioning, plumbing, and sewerage.

How to plumb 51 acres of floor space

There's enough plumbing in Cobo Hall, Detroit's new exhibition building, to serve a city of 70,000 people. It took more than 13 miles of USS National Galvanized Steel Pipe, 2½" to 12" diameter, just to connect the fixtures, lavatories, showers, drinking fountains and drains. In addition to four gargantuan exhibition areas, Cobo Hall has 32 meeting rooms, a cafeteria, a coffee shop, and a banquet hall that doubles as a ballroom. USS National Pipe air conditions the 10-acre structure . . . enough of it to handle 10,000 gallons of water a minute. Even the sewerage system soil lines contain USS National Pipe. The architect specified steel pipe because almost all piping had to be suspended from the ceiling. Steel pipe, with its high-strength-to-weight ratio, was faster and cheaper to install and required fewer hangers. ☐ Whether you're planning a one-roomer or the world's largest, it pays to specify USS National Pipe. You'll get fast delivery of top quality pipe in all sizes for power, heat, utility lines, or air conditioning and you'll also get prompt technical assistance from the most qualified men in the field. National Tube salesmen are backed by the engineers and research scientists from our research laboratory. Just call or write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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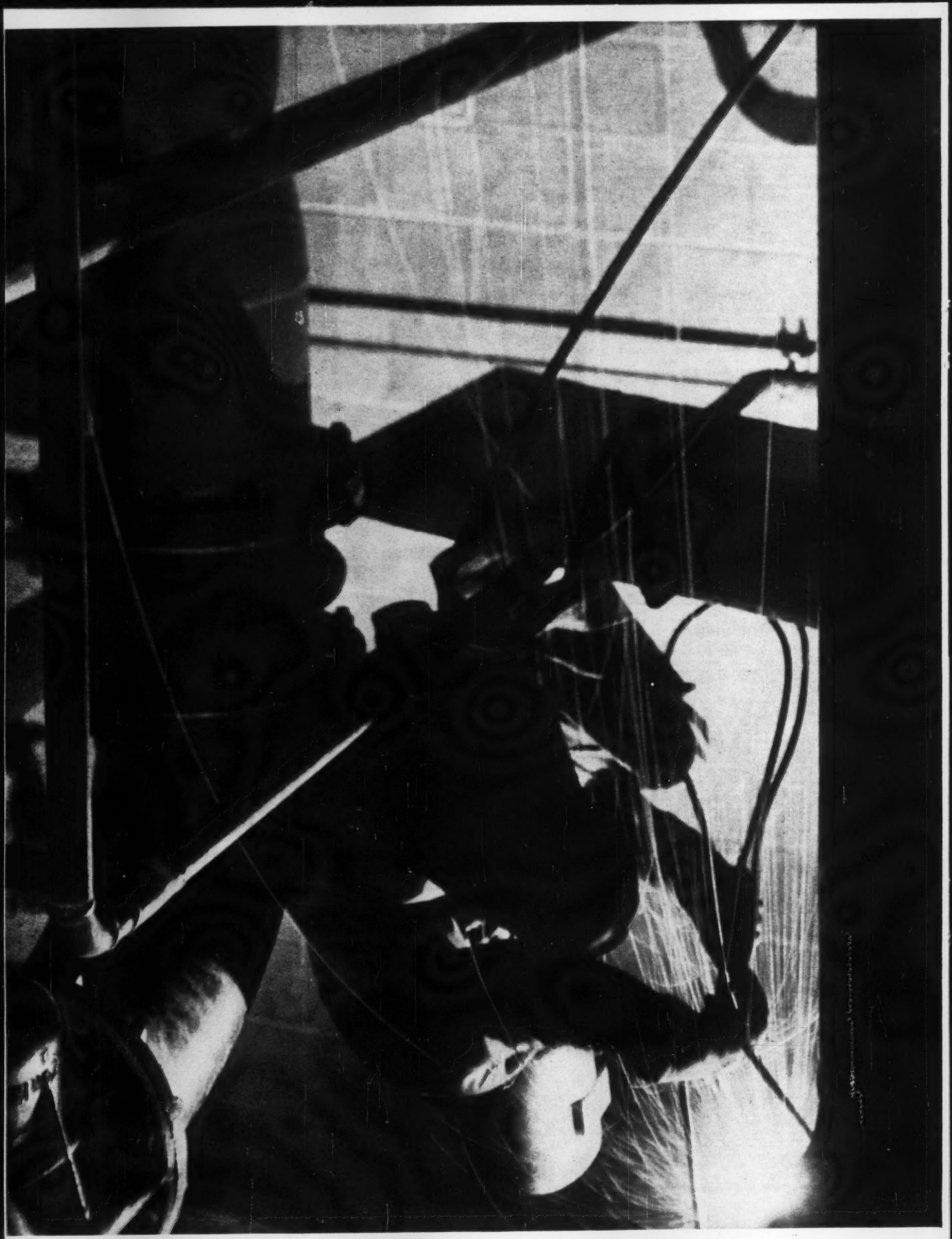
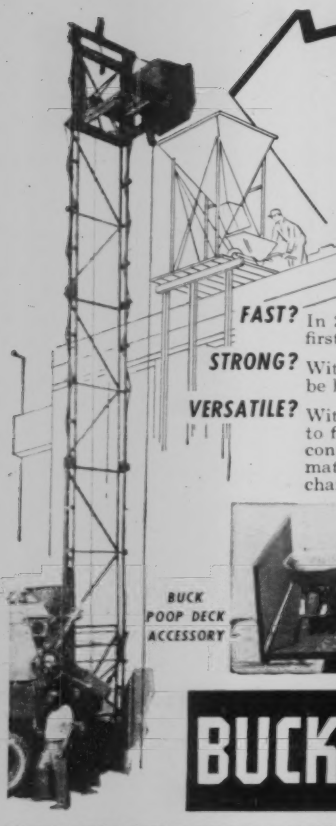
Finishing up a weldment on the water cooling section of Cobo Hall's air conditioning. The system's output is equal to that of 7,000 window units ▶





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F G H I J K L M N O P Q R S T U V W X Y Z

(Continued from page 161)

▲ **N. J., Denville**—Bd. Educ., Denville Boro, Openaki Rd., referendum bonds and project May 9, ELEMENTARY SCHOOL, Diamond Spring and River Rds. $1,130,000. Micklewright & Mountford, 710 Quinton Ave., Trenton, archts. CD 1/23/61.

N. J., Manasquan—Bd. Educ., Manasquan Boro, 15 Taylor Ave., approved referendum bonds and project Mar. 21, HIGH SCHOOL ADDN. $700,000. Micklewright & Mountford, 710 Quinten Ave., Trenton, archts. CD 2/9/61.

▲ **N. J., Trenton**—New Jersey Division of Purchase & Property, State House, plans by Alfred Clauss, 114 W. State St., OFFICE for State Dpts. of Health and Agriculture, John Fitch Way Redevelopment area. $6,000,000. Bids 9/1/61. CD 1/18/60.

▲ **N. J., Trenton**—New Jersey Division Purchase & Property, State House, plans by Frank Grad & Sons, 11 Commerce St., Newark, STATE MUSEUM, STATE LIBRARY and ARCHIVES SECTION, W. State St. $5,000,000. Bids early in 1962.

▲ **N. J., West Long Branch**—Shore Regional High School Dist., Locust Ave., voted referendum bonds and project Mar. 21, HIGH SCHOOL, Turner Tract, West Long Branch. $2,218,000. Edwards & Green, 17-19 South 5th St., Camden, archts. CD 3/2/61.

N. J., West Paterson—Bd. Educ. Boro West Paterson, McBride Ave., Paterson, defeated referendum bonds and project Mar. 21, ELEMENTARY SCHOOL, Mereline Ave. $764,000. Emil Ciccone, 478 McBride Ave., Paterson, N. J., archt. CD 2/24/61.

▲ **N. Y., Brooklyn**—New York City Housing Auth., 299 Broadway, New York, Zone 7, plans by Isadore & Zachary Rosenfield, 45 W. 45 St., New York 36, N. Y. Proj. NY 5-55, 14 story Van Dyke II APARTMENT, Dumont Ave. and Powell St. $1,200,000. To go ahead 1961. CD 5/12/60.

▲ **N. Y., Huntington**—BD. Educ., UFSD No. 3, 209 Main St., plans by Eggers & Higgins, 100 East 42 St., New York 17 N. Y., Jefferson ELEMENTARY SCHOOL. $1,000,000. Bids May 1961.

▲ **N. Y., Levittown**—Levittown P. School Dist., North Village Green, Levittown, $1,780,000 referendum Mar. 29, Division Ave. SCHOOL ADDN. Referendum date extended. Office of Louis Jallade, 597 5 Ave., New York 17, N. Y., archt. CD 3/2/61.

▲ **N. Y., New City**—Clarkstown Central School Dist. 1, Carnsmar Lane, plans by Perkins & Will, 55 Church St., White Plains,
GRADE SCHOOL, Laureu Rd., $1,092,500;
JUNIOR HIGH SCHOOL, Parrot Rd., $2,693,500;
SENIOR HIGH SCHOOL ADDN., $754,000. Segner & Dalton, 55 Church St., White Plains, mechanical engrs. Garfinkel & Marenberg, 100 W. 42 St., New York, Zone 36, structural engrs. CD 3/15/61.

▲ **N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, plans by Ferrenz & Taylor, 1451 Broadway, Zone 36, Proj. No. HO-225, Phase I, 20 story Harlem HOSPITAL. $22,000,000. Constr. Late 1961; Phase II, NURSES' RESIDENCE, PARKING GARAGE, etc. $7,000,000. Constr. Late 1962. CD 1/19/60.

▲ **N. Y., New York**—New York City Housing Auth., 299 Broadway, New York, Zone 7, plans by Kahn & Jacobs, 2 Park Ave., New York 16, N. Y., Proj. NYS-64-1, 15 story Douglass HOUSES addn., Amsterdam Ave. W. 102 and 103 Sts. $1,628,000. CD 9/29/60.

▲ **N. Y., New York**—New York City Housing Auth., 299 Broadway, Zone 7, plans by Schulman & Soloway, 161-10 Jamaica Ave., Jamaica, Proj. NY 5-51, 10 story Harlem River II APARTMENT, W. 151 St., W. 152 St., 8 Ave. and Macombs Point, Manhattan Boro. $1,200,000. To go ahead 1961. CD 5/12/60.

▲ **N. Y., Plainedge**—Plainedge Unif. School Dist. No. 18, Hicksville-Massapequa Rd., Bethpage, defeated $3,220,000 referendum Mar. 11, JUNIOR HIGH SCHOOL, Baldwin Dr. $2,560,000. Knappe & Johnson, 2110 Northern Blvd., Manhasset, archts. CD 3/2/61.

▲ **N. Y., Roosevelt**—Roosevelt School Dist., Wagner Ave., voted $2,605,000 referendum Mar. 22, SCHOOLS. CD 3/2/61.

▲ **N. Y., Suffern**—Ramapo Central School Dist. 1, Hemion Rd., plans by Sherwood, Mills & Smith, 65 Broad St., Stanford, Conn., three ELEMENTARY SCHOOLS and Hillcrest SCHOOL ADDN. $3,230,000. Abrams & Moses, 2 Hamilton Ave., New Rochelle, consult. engrs. CD 3/21/61.

▲ **N. C., Lexington**—Davidson County Bd. Educ., Court House Annex, plans by J. Hyatt Hammond Assocs., 200 Worth St., Asheboro, N. C., 1 and 2 story, 80 000 sq. ft. Pilot-Fairgrove Consolidated HIGH SCHOOL. $1,000,000. John V. Sutton, 233½ N. Green St., Greensboro, struc. engr. Amin & Dixon, 101 Oberlin Rd., Raleigh, mech. engr. CD 12/15/60.

N. C., Salisbury—City, City Hall, plans by John Erwin Ramsay, 625 W. McInnis St., COMMUNITY AUDITORIUM. $700,000.

▲ **O., Akron**—Trustees Akron Library Bd., 11 S. Summit St., $3,000,000 bond election Nov. 7, LIBRARY, downtown Akron, $3,500,000. CD 11/14/51.

▲ **O., Port Clinton**—Bd. Educ., Port Clinton, plans by Buehrer & Stough, 1931 Sylvania, Toledo, HIGH SCHOOL. $1,500,000.

O., Wauseon—Bd. Educ., Wauseon, plans by Buehrer & Stough, 1931 Sylvania, Toledo, GRADE SCHOOL. $750,000. CD 11/14/55.

Pa., Collegeville—Perkiomen Joint School System plans by Wolf & Hahn, 459 Hamilton St., Allentown, Collegeville Trappe HIGH SCHOOL ADDNS.; ALTERATIONS. $700,000. Bids Summer 1961.

Pa., Oxford—Oxford Area Joint Schools plans by Buchart Engineering Corp., 611 W. Market St.,

York, JUNIOR HIGH SCHOOL. $800,000. Bids Spring 1961. CD 3/13/59.

Pa., Souderton—Souderton Area Joint School Dist., Souderton, JUNIOR HIGH SCHOOL. Over $750,000.

▲† **Tennessee**—Tennessee Valley Authority, New Sprankles Bldg., Knoxville, 900,000 kw. STEAM GENERATING PLANT, Clinch River, near Oak Ridge. $125,000,000.

▲ **Tex, San Marcos**—Southwest Texas State Teachers College, plans by Harvey P. Smith & Associates, 117 El Prado Drive, San Antonio,
MEN'S DORMITORY or HALL, $1,000,000.
WOMEN's DORMITORY, $1,000,000.
4 story student union, $550,000. Halsey & Royer, 120 W. Grayson St., and Frank T. Drought, 342 W. Woodlawn Ave, San Antonio, consult. engrs. CD 10/9/59.

▲ **Va., Charlottesville**—Virginia State Dpt. Educ., State Office Bldg., Richmond, FINE ARTS CENTER, University of Virginia. $2,300,000.

▲ **Va., Colony**—State Dpt. Mental Hygiene & Hospitals, State Office Bldg., Richmond,
HOSPITAL ANNEX, $956,400, VOCATIONAL and RECREATION CENTER, $811,200; DE JARNETTE BLDG. ANNEX, $633,400; 400-500 PATIENT INFIRMARY, $855,000, Lynchburg Training School & Hospital. CD 12/30/59.

▲ **Va., Lexington**—Virginia State Dpt. Educ., State Office Bldg., Richmond, RECREATIONAL BLDG., incl swimming pool, $845,000; ADMINISTRATIVE OFFICES, $510,000; MILITARY and AIR SCIENCE CLASSROOM, $415,000; BASEBALL DIAMOND, BLEACHERS, PARKING AREA, $150,000, for Virginia Military Institute. CD 3/16/55.

Wash., Pullman—Washington State University, Pullman, EDUCATION BLDG. $700,000.

Alta., Medicine Hat—Alberta Govt., Parliament Bldg., Edmonton, plans by J. H. Cook & Associates, 509 3rd St. S. E. 100 bed, provincial chronic HOSPITAL, $850,000.

▲ **Ont., Galt**—Bd. Educ., SECONDARY SCHOOL, west side of city. $1,000,000.

▲ **Que., Drummondville**—School Bd. of Drummondville, plans by Ferdinand Blais, 436 Lindsay St., SECONDARY SCHOOL for GIRLS, Ave. des Freres. $1,000,000. Goulet & Charron, 11th Ave. des Chataigneurs, Drummondville West, consult. engrs. CD 3/6/61.

▲ **Que., Three Rivers**—Congregation des Filles de Jesus, 1193 St. Louis Blvd., plans by Leclerc & Villemure, 1625 Royale Blvd., 3 story Domestic Science SCHOOL, des Forges Ward. $1,500,000. Jacques Tremblay, 2959 Montreal St., Ste. Foy, consult. engr.

COMMERCIAL BUILDINGS

▲ **Calif., Milpitas**—Mobilvillage, Inc., 1419 Broadway, Oakland, plans by Theodore R. Moist, 355 Grand Ave., Oakland, MOBILE HOME PARK, swimming pool, tennis courts, etc. $2,000,000. J. Y. Long Co. Engineers, 132 9th St., Oakland, engrs. CD 2/14/61.

▲ **Calif., Napa**—Randolph Parks, 451 Park Fair Dr., Sacramento, plans by Robert M. Keenan, 584 Third, concrete, stone, River Park SHOPPING CENTER. $1,500,000.

Calif., Sausalito—Douglas Lange Corp., 183 Santa Rosa Ave., plans by Edmund C. Heine, 3030 Bridgeway, 3 story, 49 room, Vina del Mar Inn HOTEL, Bridgeway, 2-level, rein.-con. parking, wood-frame, swimming pool. $750,000.

Conn., Cromwell—Holy Apostles Seminary, 33 Prospect Hill Rd., Plans by Adam, Lee & Crabtree, 968 Farmington Ave., West Hartford, 9 SEMINARY CLASSROOMS. $900,000.

Conn., New Haven—Urban Assocs., Inc., 39 Church St., 175 units 2 APARTMENTS, 1314 Quinnipiac Ave. and 631 Russell St. $775,000.

▲ **Conn., Waterbury**—Colonial Plaza Corp., 1359 Thomaston Ave., 80 lanes BOWLING ALLEY, Thomaston Ave., $2,000,000.

Conn., West Haven—Grand Union Co., 100 Broadway, East Paterson, N. J., plans by Frederick Saphier, 204 Fourth Ave., New York, N. Y. SUPERMARKET, Campbell Ave. $800,000, CD 3/23/61.

▲ **Fla., Coral Gables**—University of Miami, 1200 Campo Sano Ave., Miami, plans by Robert M. Little, 2180 Brickell Ave., Miami, 7 story, women's DORMITORY. $2,700,000. Dignum Assocs., 260 Palermo Ave., struct. engrs. Weeks Engineering Co., 1753 S.W. 3rd Ave., Miami, mech. engr. CD 12/15/60.

▲ **Fla., Largo**—Tri City Plaza, 773 34th St. N., St. Petersburg, plans by Edward Dean Wyke, 1224 Manatee Ave. W., Bradenton, 27 acre SHOPPING CENTER, $1,000,000.

▲ **Ill., Chicago**—Illinois Masonic Hospital, 834 W. Wellington Ave., plans by Schmidt Garden & Erickson, 104 S. Michigan Ave., 8 story HOSPITAL addn., Dpt. of Psychiatry, $2,000,000. Bids in 1961. CD 3/22/59.

▲ **Ind., Fort Wayne** — Brotherhood Mutual Life Ins. Co., Circumurban Hy., 1 story, 3 unit CONVALESCENT HOME FOR ELDERLY, 8-acre site at southwest corner Circumurban and Hobson Rd. $1,500,000.

▲ **Iowa, Davenport**—Roy Fisher, Inc., 111 Insurance Exchange Bldg., 13 APARTMENTS, north of Duck Creek between Fair Ave. and Harrison St. $1,500,000-$2,000,000.

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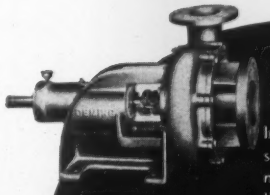

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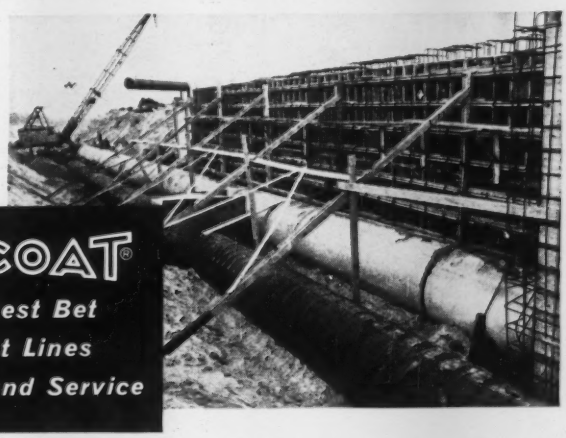

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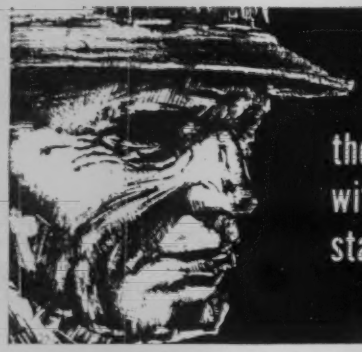

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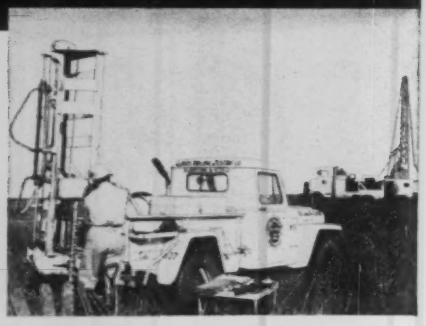

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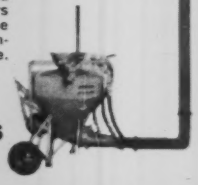

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▲ **Iowa, Des Moines** — St. Joseph's Academy, 3200 Grand Ave., Zone 12, plans by Dougher-Frevert-Ramsey, 202 Garver Bldg., Zone 9, multi-story rein.-con. ACADEMIC BLDG. **$1,250,000.**

▲ **Md., Greenbelt**—Edward M. Perkins & Assocs., 301 Springbrook Dr., Silver Spring, plans by Cohen, Haft & Assoc., 7961 Eastern Ave., Silver Spring, garden-type APARTMENT, 1st Section, Intersection of Kenilworth Ave. and proposed Capital Beltway. **$5,000,000.** Bids June 1961.

▲ **Md., Rockville**—Merrimac Constr. Co., 4916 Del Ray Ave., Bethesda, plans by Cohen, Haft & Assoc., 7961 Eastern Ave., Silver Spring, 280 unit garden type APARTMENTS, Section II, Congressional Airport Lane and Jefferson St. **$1,960,000.**

Md., Silver Spring—Samuel M. Badian, 8515 Farrell Dr., Chevy Chase, plans by Walter Bucher, 918 Sligo Ave., 4 story 60 unit APARTMENTS, East-West Highway near Sundale Rd. **$800,000.** Bids Summer 1961.

▲ **Md., Silver Spring**—Operations Research, Inc., 8605 Cameron St., plans by Ted Englehardt, 933 Gist Ave., Silver Spring, Md., 54,000 sq. ft. OFFICE, 1st and Anson Sts. **$1,000,000.** Bids July 1961.

▲ **Mich., Ann Arbor**—Missouri Synod, Lutheran Church, 210 N. Broadway, St. Louis, Mo., JUNIOR COLLEGE, 210 acre site 2 mi. east of here, **$6,000,000.** Bids late 1961.

▲ **Mo., Clayton (St. Louis 5 P. O.)**—Bernard Land Corp., 111 S. Meramec Ave., Zone 5, plans by Bernard McMahon, 111 S. Meramec Ave., Clayton 5, Mo., 10 story OFFICE, and 4 story 300-car GARAGE, Bemiston and Sappington Aves. **$1,250,000.** Bids about June 1, 1961.

N. H., Manchester—Dunfey Realty Corp., 490 Lafayette Rd., Hampton, plans by Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., 80/100 units, MOTEL, Rte. No. 3, **$900,000.** Bids June 1961.

▲ **N. J., Passaic**—Milan Assocs., 1079 U. S. Hy. 46, Clifton, plans by C. J. Kordys, 1379 Hamburg Turnpike, Wayne, APARTMENT between Brook and Terhune Aves. **$3,000,000.**

▲ **N. Y., New York**—Balaban Gordon Co., Inc., 1475 Broadway, Zone 36, plans by Seymour R. Joseph, 1841 Broadway, Zone 23, 161 unit. The Clayton APARTMENT, Lenox Ave. between 134 and 135 Sts. **$2,975,000.** Constr. May 1961.

▲ **N. Y., New York**—John Pollak, 18 E.48 St., Zone 17, plans by William Lescaze, 211 E.48 St., Zone 17, 19 story 180 unit Monterey Towers APARTMENT, Monterey Ave., Lafontaine Ave., E.180 St., E.181 St. Bronx Boro. **$2,944,200.**

▲ **N. Y., New York**—George B. Rabinor, 158 Irving Pl., Woodmere, plans by Oscar Silverstone, 666 5 Ave., New York 19, N. Y., 10 story 160 unit Elder Terrace APARTMENT, 1.25 acres, east side Elder Ave., north of Bruckner Blvd., Bronx Boro. **$3,022,000.** Constr. June 1961.

▲ **N. Y., New York**—George B. Rabinor, 158 Irving Place, Woodmere, plans by Oscar Silverstone, 666 5 Ave., Zone 19, 10 story, 38,000 sq. ft. 100 unit Oak Towers APARTMENT, east side Cruger Ave. between N. Oak Dr. and S. Oak Dr. **$1,974,000.** Bids May 1961. CD 7/22/60.

▲ **N. Y., New York**—Salvatore G. Schimenti, 42-15 Crescent St., Long Island City, Zone 1, plans by Henry George Greene, 855 6 Ave., Zone 1, 165 unit Nagle House APARTMENT, 112 acres northwest corner Nagle Ave. and West 204 St. **$2,806,050.**

▲ **N. Y., New York**—Uniformed Fireman's Assocs. of Greater New York, 38 Park Row, Zone 38, plans by Tito DiVincenzo, 136 E. 57 St., Zone 22, 12 story 138 unit Bailey Towers APARTMENT. **$3,393,000.** Constr. May 1961. CD 5/4/60, under Bailey Constr. Corp. as owner.

▲ **N. Y., New York**—Samuel A. Whinston, 2830 Sedgwick Ave., plans by Charles N. & Seelig Whinston, 2 Tudor City Place, New York, Zone 17, 16 story 64 x 187 ft. 147 unit Morris Heights APARTMENT, west side of Sedgwick Ave. near Tremont Ave., Bronx Boro. **$2,770,000.** CD 10/3/60.

▲ **N. Y., Plainview**—Pickwick Bldg. Organization, c/o Samuel Paul & Seymour Jarmul, archts., 59 E. 54th St., New York, Zone 22, 2 story, V-shaped, 100 unit MOTEL, two swimming pools, etc., 6 acre site Round Swamp Rd. and L. I. Expressway. **$1,250,000.**

N. Y., Woodbury—Waldemar Medical Research Foundation, 16 E. Sintsink Dr., Manorhaven, MEDICAL RESEARCH and CANCER DIAGNOSTIC CENTERS, 10 acre site, East side Sunnyside Ave. north of Northern State Parkway. **$700,000.** Bids Aug. 1961.

▲ **N. C., Charlotte**—Green Oaks Apartment c/o David W. Hardwicke, archt. 303 W. Cary St., Richmond, Va., 1,200 APARTMENTS, recreational area incl. tennis courts, swimming pool, picnic area, **$15,000,000.** Emmett L. Simmons, 3108 W. Leigh St., Richmond, Va., mech. engr. Austin Brockenbrough & Assocs., 106 E. Cary St., Richmond, Va., civil engrs.

▲ **N. C., Charlotte**—Village of Green Oaks, c/o David W. Hardwicke, archt., 303 West Cary St., Richmond, Va., 100,000 sq. ft. SHOPPING CENTER, paved parking area. **$1,500,000.** Emmett L. Simmons, 3108 West Leigh St., Richmond, Va., mech. engr. Austin Brockenbrough & Assoc., 106 East Cary St., Richmond, Va., civil engrs.

N. C., Greensboro—Chester Brown, 201 North Greene, and Alan Cone, 313 Sunset Dr., 6 story 24-units, each 2,000 sq. ft. APARTMENTS, Cone Blvd., between North Elm and Page School. **$700,000.**

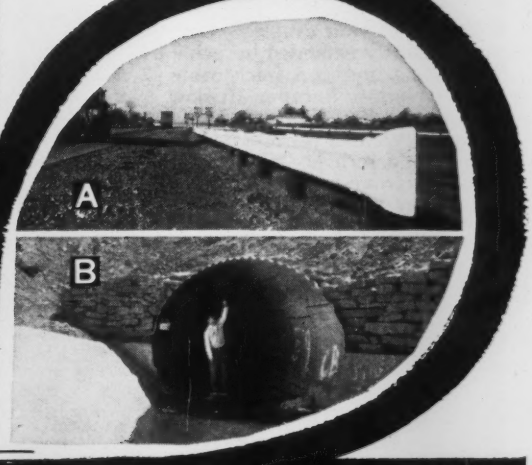
▲ **O., Columbus**—The Knolls Development Co., 677 Farrington Rd., Worthington, 500 HOUSE PROJECT, 220 acres northwest Columbus along Olentangy River Rd., and Kenny Rd., just south of Henderson Rd.

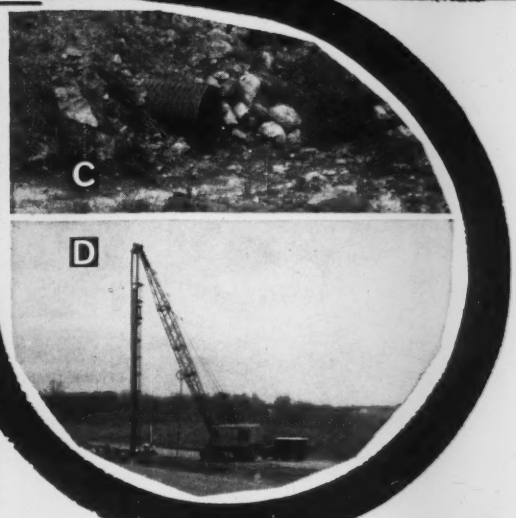
(Continued on page 168)

Interchange for main interstate highways served by 4 Armco products

Four different Armco products for drainage and construction have been installed at the new interchange for Interstate Highways 70 and 75 (old Dixie Highway and National Road) in Ohio.

That Armco products find ready acceptance in such applications is illustrated by the fact they are installed on almost every Interstate Highway. These steel products are economical. They have ample strength, are easy to install, quickly obtainable, and have enviable records for durability.





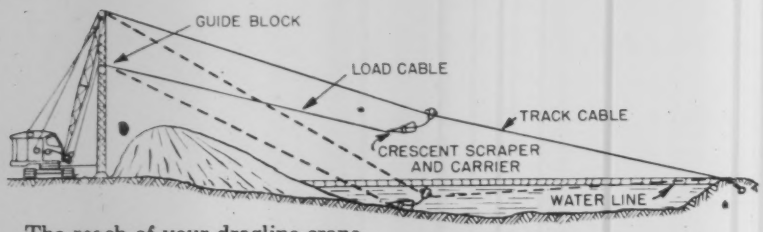
Armco FLEX-BEAM® Guardrail	A
Armco MULTI-PLATE® Stream Enclosure	B
Asphalt-coated Armco Corrugated Metal Pipe	C
Armco Foundation Pipe	D

For further data, write us, or call your nearest Armco Sales Engineer. Armco Drainage & Metal Products, Inc., 4091 Curtis Street, Middletown, Ohio.

Steel — for strength, durability, economy

ARMCO Drainage & Metal Products

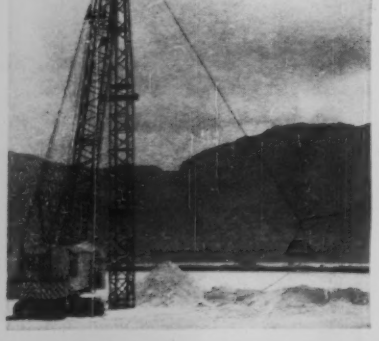
Crescent Scraper and Track Cable Extends Dragline Range, Cuts Costs



The reach of your dragline-crane can be greatly extended by using its hoisting line as a track cable for a Crescent Scraper Bucket and carrier assembly. This arrangement also permits deeper digging and recovery of material from soft ground without the use of mats or the hazard of undermining the crane.

A Crescent of greater capacity than the original dragline bucket can be used because it is much lighter size for size. When the boom is supported by an auxiliary strut as shown in the drawing, a Crescent Scraper Bucket of still greater size can be used.

▲ *A 4-yd. Crescent scraper reclaiming material from an underwater pile 300 ft. away. The bottomless scraper hauls at ground level to an elevated hopper over truck roadway. Crescent is lifted from hopper and gravity returned to pile by tensioning the track cable. The cable is moored to a float anchored about 500 ft. out in the bay.*



◀ *Crescent returning 350 ft. to excavation point. Maximum return by gravity is provided by holding the crane boom almost upright. Track cable is hooked to dozer and two anchors. Dozer is used to laterally shift tail assembly.*

•

Write or call giving make, model number and boom length of your dragline-crane. We will tell you what size Crescent is best suited to your equipment. Field Report No. 231 and Catalog J give more information on Crescent and crane setups.

SAUERMAN BROS., INC. 632 SO. 28th AVE. BELLWOOD, ILL.

LInden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

(Continued from page 166)

$15,000,000. (3 year program) Evans Mechwart, Hambleton & Tilton, 170 Mill St., Gahanna, consult. engrs. Bids 4/61.

▲ **O., Northfield**—Glazer-Marotta Co., 20515 Shaker Blvd. Cleveland, Zone 22, 13 story Northfield SHOPPING PLAZA ADDN. $1,300,000.

▲ **Pa., Lansdowne**—C. H. A. Wildman, Landowne, 12 story, 154 unit APARTMENT, Lansdowne Ave. and Scottdale Rd. Over $1,500,000. Bids Summer 1961.

▲ **Pa., Phila.**—Jefferson Medical College, 11th and Walnut St., BASIC SCIENCE BLDG. $9,200,000.

▲ **Pa., Phila.**—S. Klein Dpt. Stores, 6 Union Square, New York, N. Y., 300,000 sq. ft. DEPARTMENT STORE, $2,500,000. Bids Summer 1961.

S. C., Spartanburg—Wofford College, Spartanburg, plans by Perry, Shaw, Hepburn & Dean, 955 Park Square, Bldg., Boston, Mass., 3 story, MEN'S DORMITORY, $750,000. Thomas Amirian, 31 St. James Ave., Boston, Mass., structural engr. CD 1/30/61.

▲ **S. D., Sioux Falls**—Auguatana College, Board of Trustees, 29 and S. Summit, plans by Harold Spitznagel & Associates, 1800 S. Summit St., 2½ story, 64,000 sq. ft., brick HALL OF SCIENCE, $1,500,000. Bids in fall.

▲ **Tex., Dallas**—Medallion Department Stores, 6230 Joyce Way, Dallas,
DEPARTMENT STORE, in Oak Cliff, $2,250,000,
department store, No. 3, $1,750,000,
department store, No. 4, $1,500,000,
department store, No. 5, $2,000,000.

Tex., Dallas—Tex-Mex Corp., Vaughn Bldg., plans by More & Burns, 1424 Life Bldg., 2 story, 150 units, 50,000 sq. ft., concrete frame. Holiday Inn HOTEL, N. Central Expressway. $750,000.

▲ **Tex., Houston**—Sportsman's Center, U.S.A., J. F. LaColli, 803 Saddlebrook St., plans by John Folsom, 3767 Richmond Ave., 2 level, concrete, glass and steel, CLUB, 50 x 600 ft., A/C MALL, 37½ acres Southwest Freeway, $3,250,000.
Olympic-type, all-weather, removable roof, SWIMMING POOL, $160,000.
27,500 sq. ft. ICE SKATING RINK, $400,000.
BOWLING ALLEY, $400,000.
children's playgrounds, $160,000.
ROLLER RINK, $125,000.
18-hole GOLF COURSE, $175,000.
10 acre HARD-PAVED, DRAINAGE, PARKING LOT, $225,000.
ATHLETIC COURTS and MINIATURE GOLF COURSE, $125,000. T. C. McLain, Channelview, consult. engr. Bids Summer 1961.

▲ **Va., Lynchburg**—Owner, c/o Harvey L. Gordon, 176 South Martin, Alexandria, approx. 100 room MOTEL, RESTAURANT, incl. swimming pool, Expressway and Main St. $1,000,000.

▲ **Va., Richmond**—The Mid Town Corp., 912 East Main, plans by Marcellus Wright & Son, 100 East Main, 14 story APARTMENT, underground parking spaces, 300 block west Franklin. $14,000,000. CD 1/20/60. under Owner, c/o T. T. Hyde III, as owner,

▲ **Wash., Seattle**—Skinner Corp. and L. Smith & Co., 723 Central Bldg., Westbrook SHOPPING CENTER, W. Barton St. and 25th Ave. SW, $6,000,000, bids this year for 2 story, air conditioned JUNIOR DEPARTMENT STORE $2,250,000, to be leased by J. J. Newberry Co., J. Graham & Co., 1426 5th Ave., Zone 1, consult engrs. CD 4/28/60.

▲ **Wash., Seattle**—Swedish Hospital, Summit Ave. and Marion St. plans by Naramore, Bain, Brady & Johanson, 904 7th Ave., HOSPITAL ADDN. $3,500,000. Bids this year. CD 11/11/59.

▲ **Ont., Sudbury**—Goldhagen & Co., 665 Roselawn Ave., Toronto, four 6 story APARTMENTS, $2,000,000.

▲ **Ont., Toronto**—Dominion Stores Ltd., 605 Rogers Rd., plans by Harry B. Kohl, 491 Lawrence Ave. West, 10 story OFFICE and SUPERMARKET, St. Clair Ave. West near Delisle Ave. $2,500,000.

▲ **Ont., Toronto**—St. George's College c/o Allward & Gouinlock, archts., 245 Davenport Rd., concrete block brick, COLLEGE, CHAPEL, $2,000,000.

INDUSTRIAL BUILDINGS

▲ **Me., Fort Fairfield**—A. & P. Tea Co. National Products Div., 416 Main St., Presque Isle, POTATO PROCESSING PLANT, Approx. $1,000,000.

▲ **Mo., St. Louis**—Greyhound Corp., 140 S. Dearborn St., Chicago 3, Ill., plans by Schwarz & Van Hoefen, 721 Olive St., Zone 1, BUS TERMINAL, Broadway, Franklin Ave., Delmar Blvd. and 6th St. $2,000,000. Bids Late 1961.

▲ **N. J., Moonachie**—Paradiso & Rosen Co., Inc., 500 Baldwin Ave., Lodi, 40 plant INDUSTRIAL PARK, Moonachie Ave., three-year program. $10,000,000. Robert E. Levien, 29-46 Northern Blvd., Long Island City, N. Y., consult. engr.

Ore., Portland—White Stag Mfg. Co., 67 W. Burnside St., plans by Dougan & Heims, Royal Bldg., FACTORY HEADQUARTERS, $850,000. Bids next fall.

▲ **Pa., Butler**—International Staple & Machine Co., 810 Herrin St., Herrin, Ill., 107,500 sq. ft. STAPLING MACHINERY PLANT, $1,000,000.

▲ **Tenn., Chattanooga**—Golden Gateway Car Park, Inc., c/o Real Estate Management, Inc., 709 Chestnut St., 5 story, 570-car PARKING GARAGE, $1,545,000.

▲ **Ont., Sarnia**—Polymer Corp., Ltd. (Crown Corp.), S. Vidal St., POLYBUTADIENE RUBBERS PLANT used to mfg. heavy duty tires, $10,000,000. Bids April or May 1961. CD 6/16/54.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Massachusetts Turnpike Authority, 60 Bolyston St., Boston, ROAD,
Perini Corp., 73 Montwait Ave., Framingham, Mass., **Morrison-Knudsen Co., Inc.**, 319 Broadway Ave., Boise, Idaho, and **Kaiser Div., H. J. Kaiser Co.**, 1924 Broadway, Oakland 12, Calif., LB approx. **$91,800,000,** (contract being negotiated) Toll Road Weston to Boston. Howard Needles, Tammen & Bergendoff, 99 Church St., New York, N. Y., engrs. CD 4/1/54.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Amityville**—BA 4/25—Bd. Educ., JUNIOR HIGH SCHOOL. $3,500,000. Knappe & Johnson, 2110 Northern Blvd., Manhasset Blvd., Manhasset, archts. Fraioli-Blum-Yesselman, 250 E. 43 St., New York 17, N. Y., struct. engrs. Fred S. Rubin Assocs., 312 7 Ave., New York 1, N. Y., mech. engrs. CD 12/21/60.

▲ **N. Y., New York**—BA 4/25—New York City Housing Auth., Rm. 1002, 299 Broadway, New York 7, **(1)** fdns. and general constr. **(2)** heating and ventilating **(3)** electrical work **(4)** plumbing, Base Bid A (rein.-con. design) and Base Bid B (structural steel design) Proj. No. NYC-36 Mary K. Simkhovitch HOUSES, in area bounded generally by Henry St., Scammel St., Madison St., Gouverneur St., Water St., Jackson St., Franklin D. Roosevelt Dr., and Montgomery St., excluding certain portions within these boundaries and incl. certain adjacent portions. $8,000,000, plans deposit $75; furnishing and installing ELEVATORS at Mary K. Simkhovitch Houses, plans deposit $25. CD 5/3/60.

▲ **N. J., Roselle**—BA 5/11—Office of Vicar General, Archdiocese of Newark, 33 Mulberry St., Newark, **(1)** general construction (includes steel), **(2)** plumbing, **(3)** heating, ventilating, air-conditioning, **(4)** electrical work for EAST WING of new BLDG., Roselle Catholic Boys High School, N.E. corner Pine St., Raritan Rd. Plans deposit $100. Robert P. Moran, 642 Eagle Roch Ave., West Orange, archt.-engr. CD 2/13/61.

† **D. C., Wash.**—BA 6/13—Veterans Admin., Munitions Bldg., 700 bed G. M. & S. HOSPITAL and REGIONAL OFFICE MEDICAL CLINICS, $11,500,000. Eggers & Higgins and Edwin A. Keeble Assoc., Inc., 2000 Glen Echo Rd., Nashville, Tenn., archts. CD 1/19/61.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROAD,
Hendrickson Bros., Inc., 63 N. Central Ave., Valley Stream, N. Y., CA **$4,926,213**, est. $6,001,000, 9 in. conc. pavt. 3.09 mi., misc. work 0.2 mi., acc. 1.9 mi. c. conc. pavt. and 1.68 mi. b. conc. pavt. 5 HGS comp. WF beam, 2 sps. 142.2 ft. total, 2 sps. 146.5 ft. total, 2 sps. 115.2 ft. total, 1 sp. 76.3 ft. total, 1 sp. 57.8 ft. total, 2 RGS steel girder 2 sps. 138 ft. total, 1 sp. 104 ft. Wantagh-Oyster Bay Expressway, Contr. 2, Hempstead Turnpike Old Country Rd. FAWOBE 61-1, Proj. U-UG-1110 (3) Nassau Co. BA 2/23, CA 3/29. CD 2/24/61, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, BRIDGE,
Wm. M. Moore Bldg. Corp. & Lopier Constr. Corp., 360 Lexington Ave., New York 17, N. Y., CA **$2,644,340,** bridge substructure comprising 2 abutments and 26 piers 4,232.7 ft. total, Fire Island Inlet Bridge (Captree State Park to Fire Island State Park), Contr. 1, FIIB 61-1, Suffolk Co. BA 2/23. CD 3/2/61, under LB.

BUILDINGS—LB & CA

▲ **Rand Constr. Co., Inc.**, 386 Park Ave. So., New York 16, N. Y., CA **$1,414,500**, STUDENT UNION, BROOKLYN, N. Y. Brooklyn College, Bedford Ave. and Ave. H, Brooklyn, N. Y. BA 3/7, CA 3/16. CD 3/10/61, under LB.

▲ **John T. Brady & Co., Inc.**, 606 W. 47 St., New York 19, N. Y., CA **$1,672,000**, general contract CLASSROOM and STAFF ROOM BLDG., Brooklyn College, BROOKLYN, N. Y. Bd. Higher Educ., Brooklyn College Business Office, Rm. 1159, Boylan Hall, Bedford Ave. and Avenue H, Brooklyn 10, N. Y. BA 1/31, CA 4/3. CD 2/3/61, under LB.

▲ **Green Manor Constr. Co., Inc.**, 380 West Middle Turnpike, Manchester, Conn., LB Est. **$15,000,000,** build-lease 40,000 sq. ft. OFFICE, LABORATORY, STORAGE and GARAGE SPACE for use by Department of Health, Education and Welfare, Food and Drug Administration, BUFFALO, N. Y. General Services Admin., P. Bldgs. Service, Acquisition and Disposal Div., 250 Hudson St., New York 13, N. Y. BA 4/3. CD 3/8/61.

▲ **J. P. Blitz, Inc.**, 545 Madison Ave., New York 22, N. Y., CA **$7,174,600**, Contrs. 5 and 6, fdns. and general contract John Adams HOUSES, Proj. NY-5-49, E. 156 St., Union Ave., E. 162 St. and Westchester Ave., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Grand total $10,349,346. BA 3/14, CA 4/4. CD 3/16/61, under LB;
H. Sands & Co., Inc., 11 Park Pl., New York 7, N. Y., CA **$772,400**, Contr. 7, heating and ventilating John Adams HOUSES (New York, N. Y.);
Simpson Electric Corp., 1857 2nd Ave., New York, N. Y., CA **$777,600**, Contr. 8, electrical work John Adams HOUSES (New York, N. Y.);
Seaberg Elevator Co., 243 44 St., Brooklyn, N. Y., CA **$503,396**, Contr. 8, elevators, John Adams HOUSES (New York, N. Y.);
Abraham Newmeyer, 106 St. and F. D. R. Dr., New York, N. Y., CA **$1,121,350**, Contr. 9, plumbing John Adams HOUSES (New York, N. Y.).

▲ **Perlbinder Realty Corp.**, 19 W. 44 St., New York 36, N. Y., Owner Builds, **$1,500,000**, 17 story 10,000 sq. ft. 176 unit APARTMENT, 428-432 W. 34 St., NEW YORK, N. Y. CD 2/16/61.

▲ **Stuart Constr. Corp.**, 21 Plymouth Dr., Marlton, N. J., Owner Builds, **$2,800,000**, 250-unit RESIDENTIAL DEVELOPMENT, MARLTON, N. J.

▲ **Joyce Park, Inc.**, 223 Emory Ave., Trenton, N. J. Owner Builds, **$1,044,000**, 58-unit RESIDENTIAL DEVELOPMENT, Paxon Ave., etc., TRENTON, N. J.

▲ **Verree-Welsh Homes, Inc.**, 9140 Verree Rd., Phila., Pa., Owner Builds, **$5,000,000**, RESIDENTIAL DEVELOPMENT (350) NORTHAMPTON, PA.

▲ **Frederick Constr. Co.**, 615 N. Market St., Frederick, Md., CA **$2,455,064**, Wheaton-Kensington HIGH SCHOOL, Kensington, ROCKVILLE, MD. Montgomery County Bd. Educ., County Bldg., Rockville, Md. BA 3/23/61. CD 3/27/61, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Va., Chantilly**—BA 4/27—Federal Aviation Agency, Room 2606, Temporary Bldg. 5, 16th and Constitution Aves. N.W., Wash. 25, D. C., completing interior TERMINAL BLDG., Dulles International Airport. CD 7/23/51.

▲† **West Virginia**—BA 5/16—U. S. Eng., 502 8th St., Huntington, Zone 1, DAM, DIKES and SPILLWAY, Summersville Reservoir Proj., Gauley River, CIVENG-46-022-61-54, Over $10,000,000. CD 3/31/61.

BUILDINGS—BA

▲ **Ga., Chamblee**—BA 4/21—General Services Admin., 50 7th St., NE Atlanta, build and lease 188,000 sq. ft. OFFICE, for Internal Revenue Service. $2,000,000. (Correction—bid date). CD 3/17/61.

▲ **Ky., Newport**—BA 5/8—Campbell County Fiscal Court, 240 4 St., duplex-type Lakeside Manor HOUSING for AGED, INFIRMARY, Cold Springs. $2,500,000. Extended date. Merriweather, Mayre & Assoc., 248 Short, Lexington, and Edw. J. Beiting, Jr., 1002 Monmouth, Newport, archts. CD 3/6/61.

HEAVY CONSTRUCTION—LB & CA

▲† **NORTH CAROLINA** — Bureau P. Rds., Dpt. Commerce, 920 S. Jefferson St., Roanoke, Va., ROAD,
Lewis Constr. Assn., Inc., P.O. Box 16, Goldsboro, N. C., CA **$1,905,287**, Proj. 2S2, grading, four tunnels with linings, crushed aggreg. base, Chestnut Cove Gap to Beaverdam Gap, Blueridge Parkway. BA 3/23/61. CD 3/27/61, under LB.

BUILDINGS—LB & CA

▲ **Eugene Simpson & Brother, Inc.**, 300 Montgomery St., Alexandria, Va., LB **$2,397,733**, (5 bidders), Hermitage HOME for the AGED, Franklin Ave., ALEXANDRIA, VA. Virginia Conference of the Methodist Church, 4016 West Broad St., Richmond, Va. BA 4/4/61. CD 3/8/61.

▲ **Robert Blum & Co.**, 203 N. Wabash Ave., Chicago, Ill., CA **$6,000,000**, 10 story, 257 units APARTMENT, YACHT BASIN, Normandy Isle, MIAMI BEACH, FLA. Robert Blum & Robert Rautbord & Assocs., 203 N. Wabash Ave., Chicago 1, Ill. Fridstein & Fitch, 228 N. La Salle St., Chicago 1, Ill., archts. CD 3/31/61.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† **Illinois**—BA 5/24—U. S. Eng., 420 Locust St., St. Louis 2, Mo., MAIN DAM-GATED SPILLWAY, Carlyle Reservoir, east side Kaskaskia River, Clinton Co., near Carlyle, $3,500,000. CD 9/23/60.

HEAVY CONSTRUCTION—LB & CA

▲ **J. M. Corbett Co.**, 2500 S. Corbett St., Chicago, Ill., CA **$1,649,863**, No. 066-1919. 8-CE, 4-span plate girder BRIDGE, South Rte. Expressway, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill. BA 3/14/61, CA 4/3/61. CD 3/20/61, under LB.

▲ **Malan Constr. Corp.**, Lee and Higgins Rd., Des Planies, Ill. LB **$4,357,000**, HEATING and REFRIGERATING PLANT O'Hare Field, CHICAGO, ILL. City, City Hall, Chicago, Ill. BA 4/3/61. CD 3/20/61.

BUILDINGS—LB & CA

▲ **R. S. Ursprung Co.**, Hanna Bldg. Annex, Cleveland 15, O. CA **$1,733,400**, est. $3,000,000, general contract HIGH SCHOOL, BEREA, O. Bd. Educ., 390 Fair St., Berea, O. BA 3/28/61, CA 3/31/61. CD 4/5/61, under LB.
Spohn Heating & Ventilating Co., 1775 E. 45th St., Cleveland 3, O., CA **$594,625**, mechanical contract, HIGH SCHOOL, (Berea, O.)

▲ **Davison Obenauer**, 16644 E. Warren Ave., Detroit, Mich. Owner Builds, **$4,000,000**, $3,000,000 first year (to complete 1½ years) 307 unit HOUSING DEVELOPMENT, Coachlight Village, HOLLAND, O.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—LB & CA

▲ **H. B. Zachary Co.**, P. O. Box 10188, San Antonio, Tex., LB **$4,974,382**, est. $4,000,000, (9 bidders), 8800 parallel NW-SE RUNWAY, Love Field, DALLAS, TEX. City, City Hall, Dallas, Tex. BA 4/3/61. CD 3/29/61.

BUILDINGS—LB & CA

▲ **Omaha Public Power Dist.**, Electric Bldg., Omaha, Neb., rejected bids Mar. 23, 125,000 kw. Fourth Unit at North Omaha STATION, OMAHA, NEB. **$1,743,048.** Will re-advertise. CD 3/27/61, under LB.

▲ **B & G Constr. Co.**, 32120 N.W. 65th St., Oklahoma City, Okla., CA **$4,750,000,** 450,000 sq. ft., masonry A/C SHOPPING CENTER, LAWTON, OKLA. R. Lewis Barton, 819 S.W. 30th St., and J. Wiley Richardson, 5012 Classen Blvd., Oklahoma City, Okla.

FAR WEST

BUILDINGS—BA

▲ **Calif., San Diego**—BA 4/24—Pt. Loma Plaza, c/o Richard George Wheeler, archt., 3276 Rosecrans, San Diego, Zone 10, (selected list bidders), 1 story, 130,000 sq. ft. masonry Pt. Loma PLAZA, shop bldgs, and supermarket, Rosecrans. $1,500,000.

▲† **Calif., Monterey**—BA 5/2—Dist. P. Wks. Office, 12th Naval Dist., Rm. C 112, San Bruno, 150 unit CAPEHART HOUSING, U. S. Naval Post Graduate School. $2,475,000. CD 2/13/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Gunderson Bros.**, 4700 NW Front Ave., Portland, Ore., LB Est. **$5,083,000,** (5 bidders), FLOATING DRY DOCK, PORTLAND, ORE. Port of Portland, Swan Island, Portland, Ore. CD 2/9/61.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 4/5, ROAD,
R. R. Hensler, 7550 Wheatland Ave., Sun Valley, Calif., LB **$4,839,024,** (5 bidders), grading, paving 5.8 mi. 4 lane freeway US Hy. 446 between 0.1 mi. east of Caliente Rd. and ½ mi. east of Keene, Kern Co. CD 3/1/61.

▲† **Allis-Chalmers Mfg. Co.**, 1127 S. 70 St., Milwaukee, Wis., CA **$1,491,400,** 75,000 kw GENERATORS for Spring Creek Powerplant, Central Valley Proj. near Redding, Shasta Co., Spec. 5447, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. BA 1/5. CD 1/10/61, under LB.

BUILDINGS—LB & CA

▲ **Lathrop Co.**, Box 1540, Anchorage, and **Lease Co.**, 1501 N. 35 St., Seattle 3, Wash., Owners Build, **$4,000,000,** 8 story, rein.-con., steel frame OFFICE, ANCHORAGE, ALASKA. Federal Aviation Agency, lessee. CD 10/27/60.

▲ **J. A. Phillips Constr.**, 1584 Katella Ave., Anaheim, Calif., CA **$1,818,500,** 151 stucco DWELLINGS, Tract 3760, GARDEN GROVE, CALIF. Tropic Homes, 1584 Katella Ave., Anaheim, Calif.

▲ **Duane Co.**, 10835 Santa Monica, Blvd., Los Angeles 25, Calif., Owner Builds, **$1,738,610,** 121 stucco DWELLINGS, Tract 3947, LA HABRA, CALIF.

CANADA

BUILDINGS—BA

▲ **Que., Montreal**—BA 4/25—Elmhurst St. Holdings, c/o David K. Linden, archt., 5060 Western Ave., 12 story, 169x180 ft. APARTMENT, Sherbrooke St. W. $2,000,000. Bregman & Hamann, 146 Bloor St. W., Toronto, Ont., assocs. archts. CD 12/20/60.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **ARGENTINA**—BA 5/5—Direccion Provincial de Vialidad, Secretaria, Palacio Municipal, Santa Fe, Pcia de Santa Fe, ROAD,
163 mi. roads, Provincial Hy. 16 and Provincial Hy. 13. $11,000,000.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

▲ **Jordan and Saudi Arabia**—BA On Or About 5/15—Executive Committee for Recommissioning Hedjaz Railway Line, P.O. Box 134, Damascus, Syria, REHABILITATING RAILWAY LINE between Ma'an (Jordan) and Madina Al-Munawara (Saudi Arabia) 503 mi. Total cost $25,000,000. Plans deposit $35.50. Extended date. Brown Engineers, International, 60 W. 55 St., New York, N. Y., U.S.A., engrs. CD 2/15/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Hydrotechnic Corp.**, 32 E. 57 St., New York 32, N. Y., U.S.A., CA **$1,500,000,** Saigon-Cholon WATER SYS., incl. water pipe line, pumping station, reservoirs, treatment plant, SAIGON, VIETNAM. Public Works Department, Govt. Vietnam. CD 10/15/59.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **India, Tanapur**—BA 8/31—Tanapur Atomic Power Project, Dpt. Atomic Energy, Govt. India, New Delhi, Tanapur ATOMIC POWER PROJECT.

(Proposal Advertisements see pp. 188 to 191)

Tandem pushing with D9 Tractors...
"WE'RE 25% AHEAD OF SCHEDULE"

V. H. RIEKE, SUPT.

It's a case of a good thing made even better. Grosshans and Peterson Inc., of Marysville, Kansas, have long been sold on the advantages of tandem loading. Now they are more enthusiastic than ever. The reason? Their new tandem pushing equipment. Vincent H. Rieke, superintendent on the contractor's two million yard Interstate 235 job near Wichita, reports, "Our two new Cat D9E power shift Tractors with Pushin'-Cushin'* attachments have increased our pusher production 20-25% over our older uncushioned units. We've had to bring in two more scrapers to keep up the pace—are 25% ahead of schedule."

The Cat D9E Tractors in tandem get full loads . . . fast loads. In addition to power, two factors ideally suit the D9 to this task: the power shift transmission permits split-second, on-the-go speed changes with finger-tip ease to meet changing load requirements; and, the special pushloading equipment allows smooth, on-the-run contact with scrapers, eliminates dead seconds from loading time.

Tandem pushloading may be a real money-making proposition on your job. Your Caterpillar Dealer will be glad to discuss job requirements, demonstrate the D9 and its complete line of pushloading equipment. See him soon.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

* Mfd. by Pushin'-Cushin', Inc., Perry, Kansas

WHY D9E GIVES YOU EXTRA PROFIT ON EVERY JOB

POWER 335 HP turbocharged D353 Engine provides muscle for big loads, is dependable and economical.

MASSIVE UNDERCARRIAGE New high in durability. Quality materials and selective heat treating extend life on toughest jobs. Cam-type equalizer bar provides superior sidehill stability, increases operator confidence.

TORQUE-DIVIDER POWER SHIFT TRANSMISSION (optional). Shift on-the-go in a split second with finger-tip ease . . . even under full load. Exclusive torque divider combines anti-stall characteristics of a torque converter with operating snap of direct drive.

PLUS: Lifetime lubricated track rollers, easy-to-service dry-type air cleaners, convenient hydraulic track adjusters. Unexcelled operating ease, comfort and safety.

Caterpillar offers the most complete line of big-tractor attachments and tools available to keep your production profitable.

Smooth on-the-go contact . . . up to 3 MPH! Pushin'-Cushin'* is one of several specialized pushing attachments available for the D9E. Attachments like this increase the machine's usefulness.

The Cat power shift transmission is designed to give you plenty of power fast in the highest gear possible. Ease of shifting lets operator get more work out of the tractor, lessens his fatigue.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BOOST PRODUCTION WITH D9 PUSHER TRACTORS

By our method of reporting unemployment...

We're Giving The United States A Black Eye That Is Not Deserved

The way in which our unemployment is reported is giving the United States an undeserved black eye around the world. The broad concept of unemployment we use exaggerates the amount of unemployment in the United States as compared to most other countries. Our reporting system also falls short of presenting a balanced picture by concentrating on people who are idle, while neglecting jobs that are idle because people cannot be found to fill them. This editorial explains these defects and suggests improvements.

The *Monthly Bulletin of Statistics*, issued by the Statistical Office of the United Nations, has become a standard reference for international comparisons of economic performance, including employment and unemployment. Here, from the November, 1960 issue, is part of a table giving comparative figures on the rate of unemployment for the United States and a group of European countries:

	UNEMPLOYMENT RATE	
	Annual Average 1959	Jan.-June Average 1960
West Germany	2.4%	1.0%
Netherlands	1.8	1.4
Sweden	2.0	1.8
United Kingdom	2.3	1.9
United States	5.5	6.1

A Distorted Picture

If taken at face value the table clearly says that the United States is doing far worse in providing jobs for its citizens than the other countries whose unemployment records are listed.

But the figures are deceptive. They are made so, in part, by our government's use of a much broader concept of what constitutes unemployment than is used by most other countries.

Sweden provides a clear case in point. The table indicates that during 1959 Sweden had an unemployment rate of 2.0%, while the rate in the

United States was 5.5%. But a report from Sweden, published in the U.S. Department of Labor's *Labor Developments Abroad*, indicates that if they had used the same methods of calculating unemployment as we, the reported jobless rate in Sweden would have almost doubled. Thus a large portion of the gap between the unemployment rate in the United States and the unemployment rate in Sweden would have been eliminated.

Graduation To Unemployment

In general, countries listed in the table use registrations at public employment agencies as the basis for calculating their unemployment. Our Department of Labor, in making its sampling of unemployment, includes unregistered young people who are waiting for jobs or training opportunities as well as housewives who are looking for jobs in a general sort of way but who have not registered anywhere in search of them.

It used to be that graduation from college was regarded as a day for great celebration and rejoicing. But, because of the way the Labor Department does its counting of unemployment, it is now a day of sorrow. For unless our young people immediately rush off to jobs, they graduate into unemployment and swell our jobless figures.

While our government very expansively counts all the unemployed, there is no offsetting report on the number of jobs that are unfilled because no one qualified can be found to fill them. Currently there are many jobs in this category, and it is to be expected that there will be more as the technological revolution picks up momentum.

A properly balanced report on unemployment would include a record both of people who are idle, as conceived on some standard international basis, and jobs that are idle. A combination of the two sets of data would provide a much better indication of the economic health of a nation than unemployment alone.

The United Kingdom regularly collects figures on unfilled jobs as well as the number of unemployed. Thus it is not an impossible task to collect information on idle jobs. **For a fast moving economy, such as ours, the collection of statistics on unfilled jobs presents special difficulties. But this information is so important that Congress should see that it is added to our employment and unemployment records.**

A National Disservice

There is not the slightest inclination here to minimize the amount of unemployment in the United States at any time, or the crucial importance of doing everything possible to keep it at rock bottom. If the reporting of unemployment were simply for domestic consumption, it would be possible to make an appealing case for using a very broad conception of it. This is one way of underlining the importance of the problem.

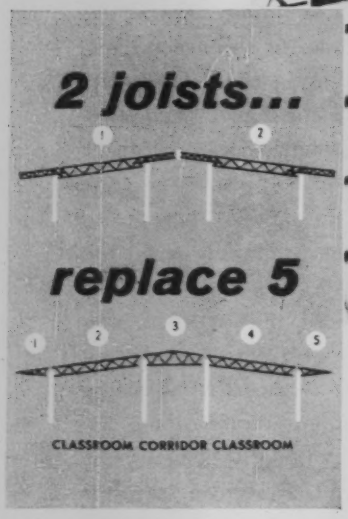
But when, as is the case, international comparisons of unemployment are treated as key gauges of the effectiveness of different economies, we do ourselves an important national disservice by using an exceptionally commodious concept of unemployment. American travelers abroad can testify that they are continuously being called upon to explain why the United States does such a relatively poor job in providing employment for its people. This is an unwise and unfair burden to impose upon the nation. **We make enough mistakes of economic commission and omission without issuing reports that distort our economic performance to our own discredit abroad.**

This message was prepared by my staff associates as part of our company-wide effort to report on major new developments in American business and industry. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or part of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY



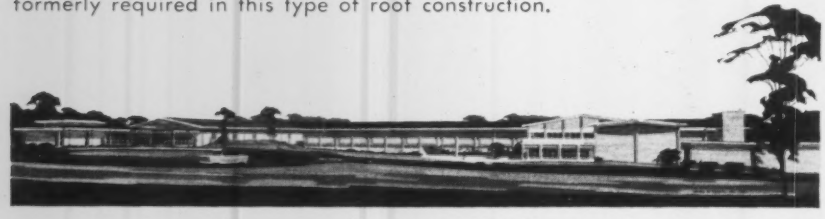
LACLEDE 34′ OPEN WEB STEEL JOISTS

cut time and cost in new school construction

Ladue Junior High School in suburban St. Louis is an excellent example of the way economy and style can be blended in today's school construction.

Cost saving was a pre-eminent factor in architect William B. Ittner's design of this low-flung structure, with its long straight runs, free of costly jogs and bends. Further economy was achieved by allowing the rolling terrain to fall away from the single continuous ridgeline, rather than to follow the contours of the ground with multi-level roofs.

This design concept was based on the selection of open web steel joists as a versatile, economical structural material. Laclede 34′ joists, with special shallow-depth ends, were used to provide an unbroken slope from ridgeline to cantilevered overhang, two joists replacing the five structural elements formerly required in this type of roof construction.



General contractor on the project was Kloster Company. Neal J. Campbell was consulting engineer.

6070

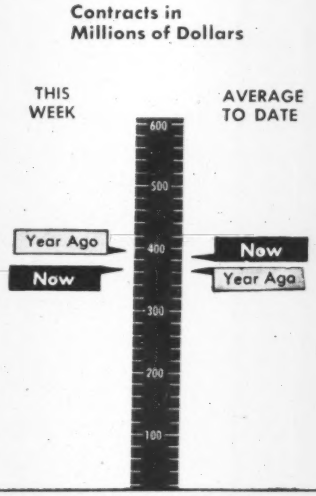
LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

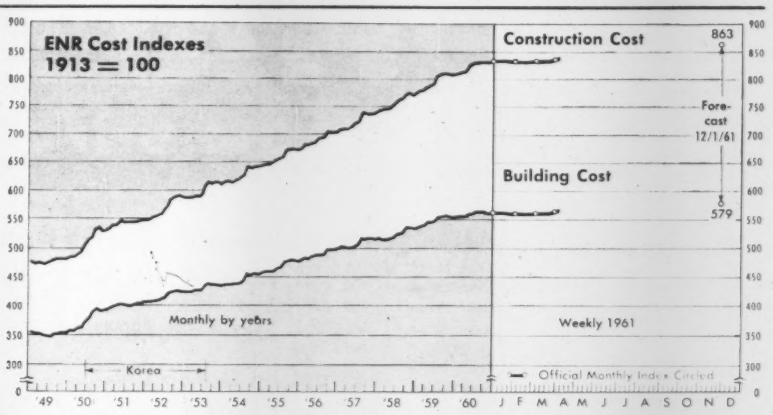
Contracts Awarded In 50 States By Type	This Week	Cum. 15 wks 1961	Chge '60-'61 %
	millions		
All Heavy Construction	$364.1	$5,736.6	+ 6
By Ownership			
PRIVATE	177.3	2,862.2	+ 1
PUBLIC	186.8	2,874.4	+11
State & Municipal	151.7	2,208.1	+12
Federal	35.1	666.3	+ 6
By Type of Work			
PUBLIC			
Waterworks	9.9	117.3	+40
Sewerage	11.5	195.4	+28
Bridges*	14.6	154.2	—46
Highways	59.1	986.8	+26
Earthwork, Dams & Waterways	14.0	191.5	+ 3
Buildings:			
Excl. Housing	42.6	686.2	+15
Housing	21.9	201.4	+46
Unclassified	13.3	341.8	— 9
PRIVATE			
Buildings:			
Mass Housing	84.0	1,280.5	— 1
Commercial	44.7	601.3	+0.3
Industrial	33.9	850.4	+36
Unclassified	14.6	129.8	—57

*Includes Private bridges

NOTE Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Apr. 6	Cum. 14 wks 1961	Chge '60-'61 %
	millions		
Corporate Securities	$ 58.1	$ 473.9	—32
State and Municipal:			
All Except Housing	89.7	1,773.8	— 1
Housing	0	22.2	+63
Federal Loans	1.4	51.0	— 2
Federal Aid	0	0	0
Total Nonfederal	$149.2	$2,321.0	— 9
Federal Appropriations:			
Projects in U. S.	1.0	1.0	....
Outside U. S.	0	0	....
Total New Capital	$150.2	$2,322.0	— 9



ENR INDEXES (1913=100), 20-cities' average	Week of Apr. 6 1961	% Change from Mar. 9 1961	% Change from Apr. 7 1960
Contruction Cost	838.71	+0.5	+2.8
Building Cost	565.92	+0.5	+1.6

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

CONTRACTS AWARDED

	1961 Mar. (millions)	1961 3-Mos. (millions)	Percent Change from 1960 Mar.	Percent Change from 1960 3-Mos.
Total U. S. (ENR reported)	$1,912	$4,932	— 4	+ 6
Private	984	2,515	— 4	+ 2
Public	928	2,417	— 5	+10
State and Municipal	658	1,823	— 8	+11
Federal	270	594	+ 3	+ 7
ENR Volume Index, 1913=100	519	513	— 3	+ 6

NEW CONSTRUCTION CAPITAL

Total U. S.	956	2,172	— 1	—10
State and Municipal Bond Sales	800	1,706	+37	+0.4
Corporate Security Sales	148	416	—57	—37
Federal Loans, Aid (nonfederal work)	8	50	—79	+ 3
Federal Appropriations, (federal work)	0	0	0	0

* Includes funds for outside U. S.

MATERIALS SHIPMENTS

	1961 Jan. (J) Feb. (F)	1961 Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Percent Change from Year Ago Cum.
Portland Cement, Bur Mines thous bbls	14,351(F)	28,526(2)	— 3	+ 4
Concrete Paving Awards, PCA thous sq yd	7,348(F)	15,981(2)	+23	+20
Fabricated Structural Steel thous tons	230(F)	462(2)	— 4	+ 3
Bookings, AISC thous tons	227(F)	499(2)	—21	— 2
Reinforcing Bars, Net, AISI thous tons	111(F)	282(2)	+ 1	—12
Lumber, NLMA mil fbm	2,258(F)	4,529(2)	—19	—17
Orders mil fbm	2,308(F)	4,680(2)	—17	—14
Production mil fbm	2,291(F)	4,554(2)	—22	—19
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face mil bri	**(J)	**(1)	....	....
Vitrified Clay Sewer Pipe thous tons	**(J)	**(1)	....	....
Structural Tile, Unglazed thous tons	**(J)	**(1)	....	....
Asphalt Products, Bureau of Census				
Asphalt Roofing thous sales sqs	1,983(J)	1,983(1)	—25	—25
Asphalt Siding thous sales sqs	45(J)	45(1)	—14	—14
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable) mil lbs	92(J)	92(1)	— 5	— 5
Wire and Cable mil lbs	24(J)	24(1)	+ 5	+ 5
Extruded Shapes (soft alloys) mil lbs	61(J)	61(1)	— 7	— 7

** January figures not yet available

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS thous	2,257(F)	2,328(2)**	— 6	— 4
Contractor Failures, Dun & Bradstreet				
Number	262(F)	481(2)	+34	+24
Liabilities thous	$14,943(F)	26,174(2)	+39	+15

** Average per month

ALPHA

BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

news and notes from the field

Modern Curing Methods Improve Concrete Quality

When cement is mixed with water it undergoes a chemical change that transforms it into "rock". When it hardens into a mass similar to rock, it is said to have hydrated. Therefore, hydration is nothing more than a chemical combination of cement and water. First, the outside of the cement particle hydrates and a cement gel (glue) is formed. As water continues to soak through this cement gel, further hydration takes place in the cement particle. The process of keeping the concrete damp and at about 70°F until it is strong enough to do the job for which it is intended is known as curing.

Importance of Curing

Curing consists of keeping the water necessary for forming the cement gel **in** the concrete and keeping the concrete at a temperature high enough or low enough so the chemical change to "rock" can take place.

For example, an average 6-bag mix using 1" aggregate can be expected to attain a strength of 3950 psi at 28 days if it is cured properly at 70°F. If the temperature is allowed to drop just 20° to 50°F, this same concrete will be slowed down in its transformation to rock and will have a strength of only 2400 psi. The same proportional differences can be expected at all ages. If during the curing period the concrete is allowed to dry out, such as may happen in hot weather, the chemical change stops right at the point where the concrete loses its moisture. Unfortunately, it is impossible to ever make the concrete good even though water is applied later.

Effect on Wearability

Since evaporation occurs more rapidly from the surface of concrete, the length of curing time is the most important factor affecting wearability. A surface that is moist cured for 28 days will result in a floor that is twice as hard as one that is protected only 3 days.

Effect on Watertightness

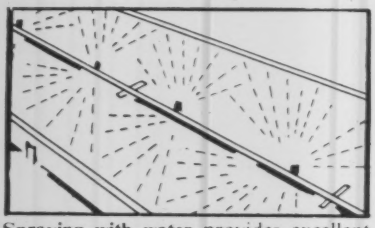
A well-proportioned and workable concrete mix generally contains about twice as much mixing water as is necessary for hydration of the cement. The reason is that about one-half of the water is used to make the concrete workable. As the cement and water hydrates, a gel is formed which expands to fill the voids left by the unneeded water as it evaporates from the concrete. If curing is stopped at one of the intermediate stages, the voids that are normally filled by the gel are left at whatever stage curing is stopped, making the concrete porous and leaky.

Effect on Durability

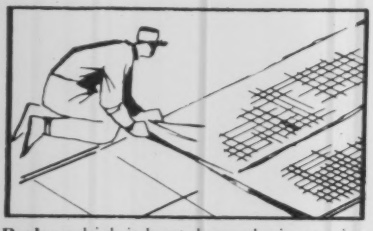
The durability or the ability of concrete to withstand the effects of freezing, thawing and weather conditions is a direct result of how much water the concrete can absorb. If the concrete quality is good to start with and if it has been cured properly, there will be no pores or capillaries through which water can enter and freeze, subsequently expanding and causing scaling.

Air entrainment helps eliminate deterioration caused by freezing and thawing cycles but good construction practices must also be followed—that means good curing.

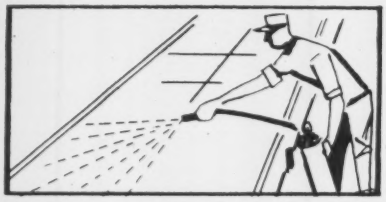
Methods of Curing



Spraying with water provides excellent results if constantly kept wet. There is a possibility of drying between sprinklings and it presents some difficulties on vertical walls.

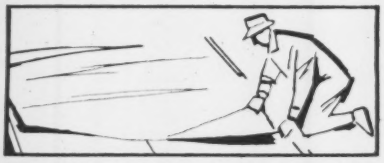


Burlap which is kept damp during curing period. Recent improvements have made burlap easier to handle, improved light reflectance and increased its fire resistance.



Membrane compounds are inexpensive and easily applied by spraying. They are available clear, black and white. Caution must be taken that the film is not broken or tracked off before curing is completed.

Waterproof paper furnishes excellent protection against drying by providing a moisture barrier that assures proper hydration. Curing papers that are reinforced last longer, and can be reused several times.



Plastic sheets are absolutely water-tight, are light and easy to handle, and provide excellent protection. They resist rotting and mildew and can be reused many times.

Other curing methods include wet earth and sand which are messy and require excessive manpower. Straw and hay are only moderately efficient; they can dry out, blow away or burn.

Test specimens show that poorly cured concrete can easily lose 50 per cent of its potential strength. **And to ignore curing is the same as removing half the cement from a concrete mix.** It is much more economical to spend a few cents per square yard in proper curing, than to spend many dollars using excessive quantities of cement. And without curing, even high cement-factor concrete can be seriously damaged.

Reprints of this page are available on request.

ALPHA

PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.

Pennsylvania Pioneers in Housing

- **New agency will make low-interest home loans that may boost housing by 100,000 units.**
- **U. S. government provides cash-grant support. If idea works, other states could adopt plan.**

Pennsylvania expects to expand the private housing market by as many as 100,000 units by plunging into the home loan business. Gov. David L. Lawrence took the first step toward mortgage lending for privately owned housing last week when he established the Pennsylvania Housing Agency. The legislature granted authority for such a body two years ago.

Although the state's primary purpose is to stimulate its own housing volume by making possible expanded home ownership among middle-income families, the program has national implications. The federal government's Urban Renewal Administration considers the Pennsylvania program a major pilot project. For this reason it provided a $300,000-demonstration grant to the state agency for initial operating expenses. The state's initial contribution is $150,000.

Under the enabling legislation, the Housing Agency can sell notes and bonds to obtain cash for loans to home buyers. Because state agencies can borrow money at rates lower than those prevailing in the private commercial money market, the state says it will be able to relend the funds to individual borrowers at lower interest rates. As security on the loan, the Housing Agency will take back a mortgage insured by the Federal Housing Administration.

Right now, state officials believe that a major source of the agency's funds will come from sale of its bonds to private lending institutions, which will also receive and process applications for mortgage loans. Officials did not say how large a service fee the new agency may have to pay the lenders for the application-processing. Neither was it reported whether the state will do all of the servicing that a mortgage requires —collection of monthly payments from the owner, disbursements to local tax collectors, payments on fire insurance, and payment of ½ of 1% mortgage-insurance premium.

Operating details of the program are not yet completed, but the agency is definitely committed to providing home loans at submarket interest rates.

The plan now is to establish basic interest rates on an area basis. These rates, however, will be subject to further adjustment up or down, depending on the income of the home buyer. The idea is to charge an interest rate that, combined with amortization, taxes, insurance and home operation costs, will keep monthly payments within the income limits of the middle-income family.

Here's how it is expected to work: Mr. Jones, who earns $5,000 a year, wants to buy a $10,000 house. He can afford a $700 down payment, so he requires a 30-year FHA mortgage of $9,300. However, the prospective costs of ownership, including mortgage interest and amortization, taxes, insurance, heating and other operating costs, are slightly more than his income will support. This, however, would be the case at prevailing rates of interest on FHA-insured mortgages—5½% interest charge, plus ½ of 1% mortgage insurance premium.

Here is where the Housing Agency would step in. It could make the loan at a lower rate of interest because the funds loaned were obtained at the generally favorable rates accorded the tax-exempt borrowings of state agencies.

By charging a total of 5% on the FHA mortgage loan—5½% basic interest, plus ½ of 1% mortgage insurance premium—the monthly amortization and interest segments of the total monthly payment would be reduced $5.83 to $49.93 a month on Mr. Jones' 30-year, $9,300-mortgage. Other things being equal, that amount of reduction could qualify Mr. Jones for home ownership.

Because the state has not yet worked out details, officials could not say what the maximum amount of mortgage loans will be and what income limits will be set. Neither are the area-interest rates determined.

However, on the basis of the latest borrowing by the General State Authority, the state may not have too much leeway in the amount of interest-reduction on the mortgage loans. On March 14 the Authority sold bonds at a 3.48% interest rate. In extending the mortgage loans the state would also have to consider the costs of administration and servicing, so the mortgage-interest rate must include those costs.

Private lenders apparently are not worried about a new competitor in the mortgage lending field. "It's a bid for the kind of business we wouldn't take . . . and may well turn out to be a losing proposition for the state," said one lender.

Massachusetts Negotiates $91.8-Million Turnpike

Competitive bidding for a major public works contract went out the window in Massachusetts last week. The state's Turnpike Authority negotiated the agreement for construction of a 12-mile extension of the Massachusetts Turnpike. Holding the contract for $91,883,000 is a three-company joint venture consisting of Perini Corp., Framingham, Mass., Morrison-Knudsen Co., Inc., Boise, Idaho, and Kaiser Co., Oakland, Calif.

The contract was negotiated to save the time required in obtaining competitive bids. "For every day we save, there will be a per diem saving of $24,000 in interest charges," says William F. Callahan, chairman of the authority.

And according to F. S. Moseley & Co., manager of the syndicate underwriting this week's $175-million construction-bond offering: "It's our judgment that the experience, unlimited equipment and financial resources of these eminently qualified construction firms would give prospective buyers of the bonds added confidence in completion of the project within the time specified."

The contract specifies penalty payments of $5,000 a day for every day of delay past the scheduled completion.

The action assures that Prudential Insurance Co. of America will move ahead on its $150-million commercial-residential center in Boston. Work was stopped last fall pending a court ruling on a contract between the company and the Boston Redevelopment Authority. The turnpike extension will cross the site and was an integral part of Prudential's plans.

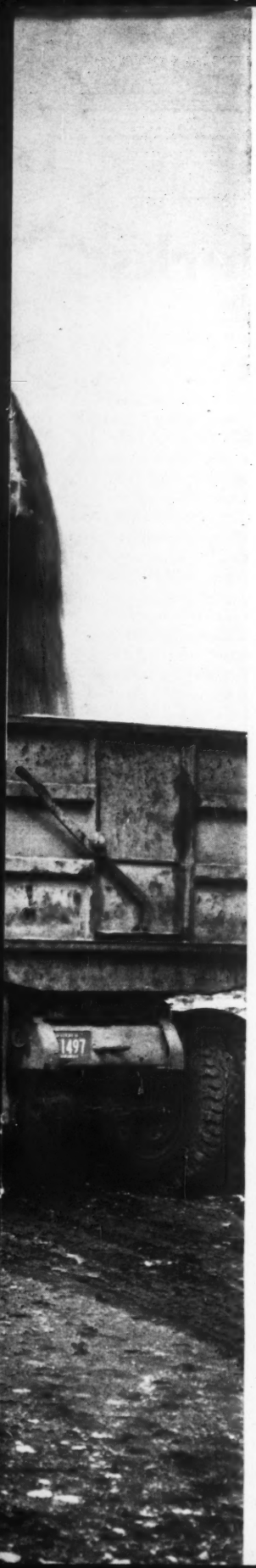
(*B&F continues on p. 180*)

11000 turbocharged diesel engine—conservatively rated at 184 hp, features Allis-Chalmers unique controlled turbulence principle that gives you more work power for less fuel dollar.

New ARROWHEAD cutting edge—provides longer life and adds protection and strength for the bucket bottom and side plates.

Safe, sure air brakes—four-wheel air brakes let you work with confidence on the steepest grades and stockpiles. If air pressure should fall below 55 psi, an interrupter in the horn circuit warns the operator in plenty of time to make necessary adjustments.

Full box frame—soaks up stress and strain . . . offers outstanding balance and stability . . . permits efficient equipment mounting.



NEW TL-30

184 hp
10,500-lb carry capacity
2½- to 6-cu-yd buckets
Weight: 28,400 lb

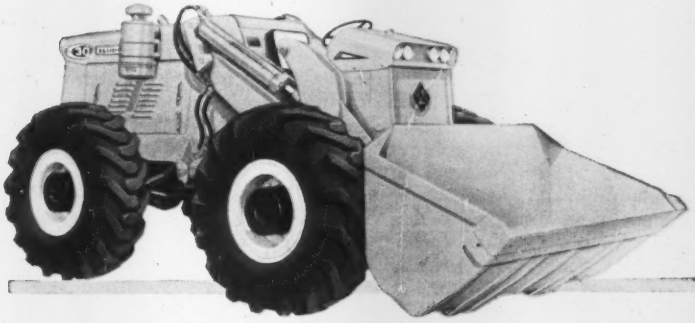
Best power and capacity in its size range

The new Allis-Chalmers TL-30 will give you more production than any other loader in this class. Its modern 11000 turbocharged diesel delivers 184 hp . . . up to 13 percent more power than others its size. This high-power output is delivered by a combustion system that has established itself as the most efficient in the industry. Proved in other Allis-Chalmers engines, this controlled turbulence, open combustion chamber design, gives you thorough mixing of air and fuel for complete, fast and even combustion . . . high fuel economy.

When it comes to carry capacity, the new TL-30 sets the pace in the industry. It carries up to 10,500 lb . . . a big 16-percent bonus over other loaders in this size range. This extra capacity lets you increase material flow . . . reduce handling costs on every shift.

The new TL-30 also features the same exclusive design and construction advantages in other Allis-Chalmers tractor loaders. Single-lever control; high dumping clearance and long reach; pin-connected axles; 5-way hydraulic filtering protection; safe dump cylinder location and added loader stability are some of the reasons why Allis-Chalmers tractor loaders have received tremendous acceptance by contractors, road builders and public officials around the country . . . in fact, around the world.

Before you decide on your next loader, make sure you get the complete story on the new TL-30, plus information on the other five tractor loader models—from 77 to 130 hp . . . 3,600 to 9,000-lb carry capacities. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



move ahead with

ALLIS-CHALMERS

. . . power for a growing world

Coming: $640 million in contracts as . . .

States Step Up Public Works

State and local governments show signs of moving public works projects of all types to the construction contract stage faster than originally planned. From various regions in the country come reports that accelerated anti-recession plans will probably result in contracts for more than $640 million worth of projects in the next nine months.

In Philadelphia, $52 million worth of projects will be contracted for by the end of September. Of this total, $34 million will be awarded by June 30, with the remaining $18 million worth to be awarded by September 30.

The city's Housing Authority will add its weight to over-all public volume; by June it will have $26 million worth of work under way. And last week the city's Parking Authority started work on a $1.5-million parking garage. Given favorable action by voters at a referendum next month, the Board of Education will be able to let construction contracts for about $15 million in school buildings. And, a $25-million redevelopment job originally scheduled for a start in December has been pushed up to August.

San Bernadino and Los Angeles counties in California are also ready to shove new business into contractors' ledgers.

San Bernardino will award within three months contracts worth more than $8 million for new schools. Another $24 million will become available for school construction for the 12-month period starting July 1.

In addition to school contracts, about $28 million in state highways and buildings will be added to the potential work available in the county. First jobs to go to contract probably will be roads; at least $4.6 million worth will be let before the end of June. And starting July 1, an additional $12.7 million worth will be let at regular intervals. Buildings planned in the same period, have an estimated construction cost of more than $9 million.

In Los Angeles County, the state, county and city governments will call for bids within nine months on $71 million worth of buildings, road and flood-control projects.

The county engineer says capital outlays by the county in the next four months will run to nearly $33 million. The Flood Control District will call for bids on 30 projects having an estimated value of $31.6 million. The state will add to this public volume with $6 million worth of highway contracts.

New Jersey will let contracts for $106 million worth of public works before the year is out. A good chunk of this volume will probably be awarded within three months. In addition, the state's education commissioner is pressing local communities to start construction on $100 million worth of new public school buildings that have already been approved by the local school districts.

Despite opposition to some features . . .

Sparkman Predicts Housing Bill

Senate approval of the Administration's huge omnibus housing legislation was predicted by Sen. John Sparkman (D., Ala.) as the first week of hearings got under way. There has been objection from some groups to specific features of the bill but all signs point to quick approval of most of it by the committee shortly after the second week of hearings is over.

National Association of Home Builders President E. J. Burke, Jr., favored liberalizing regular FHA insurance programs by lowering down-payment requirements and boosting the maximum mortgage on single-family houses from the present $22,500 to $30,000. The association backs the Kennedy proposal for 40-year, no-down-payment insured mortgages for low-income housing—but opposes other proposals that would provide low-interest loans to nonprofit organizations for rental housing.

Mr. Burke said the industry is redoubling its efforts "to develop a new house in an effort roughly comparable to what the manufacturers of automobiles have done in producing the compact car." He said this didn't necessarily mean a small house, but one suitable for low-income families in all parts of the country.

A spokesman for the savings and loan industry flatly opposed the Administration's program for low-income families. Charles Wellman, of the National League of Insured Savings Associations, said that lenders would not find attractive the 40-year mortgages and the program for rental housing to be built by nonprofit organizations. The result, he indicated, would be that the government, through the Federal National Mortgage Association (Fannie Mae), would wind up buying the mortgages with special assistance funds provided for in the Kennedy program. Mr. Wellman said such programs would produce "welfare housing" and as such should be financed through direct federal loans rather than through the "unnecessary and circuitous device" proposed in the legislation.

He gave qualified support to Administration proposals liberalizing terms of FHA-insured home improvement loans. He recommended, however, that they be limited to a maximum of $7,500 for up to 10 or 15 years, with no interest-rate ceiling. As proposed, the maximum would be $25,000 for up to 25 years at a top interest-rate ceiling of 6%.

Mayor Richardson Dilworth of Philadelphia, a prominent Democratic expert in housing and urban affairs, was strongly in favor of the Administration proposals, but suggested that they didn't go far enough in several respects. For instance, Mr. Dilworth thought the 40-year mortgage program wouldn't work without a lowering of mortgage interest rates. He suggested that a federal direct loan program would be the eventual answer.

Mayor Dilworth also advocated, as he has before, that the federal share of urban renewal costs should be boosted to 80% from the present 66⅔%. He supported his contention by citing that the federal government

Spending

The State Highway Department will let $44 million in contracts by December 31 bringing highway awards for the full year to more than $100 million.

Water-supply construction contracts totaling $20 million will be awarded in the next few weeks. And the State Health Commission is urging communities to speed contracts on $5 million worth of sewerage projects approved by the communities.

The State Commissioner of Institutions and Agencies says that $27 million worth of hospital construction contracts will be awarded before summer. Of this total, $20 million in contracts will be let by July 1. After that date, another $15 million in contracts will be let for new buildings at state colleges.

Gov. Otto Kerner of Illinois is pressuring the legislature to approve a speed-up in the state's $90-million construction program at state mental institutions. Voters approved bond issues for that amount last year.

Will Pass

now pays 90% of the cost of Interstate highway construction.

Committee members expressed some concern about whether a $9,000 or $10,000 house for low-income families would have an economic life of 40 years. Housing Administrator Robert C. Weaver said that with proper controls on planning and construction, housing in such a price range could be provided with a life of more than 40 years.

Other questioners wondered about the feasibility of interest payments, which over a 40-year period are more than twice as much as the actual price of the house.

Housing officials made it clear that the 40-year/no-down-payment program would be filling a housing need that otherwise might be met by rental housing or public housing. Monthly payments on a $10,000 house financed over 40 years would run about $51 a month, for a total cost, including interest and principal of more than $24,000.

Business in Brief . . .

• **Expansion overseas**—The Austin Co., Cleveland engineering-construction company has established new firms in Australia and Argentina, one in Sydney, the other in Buenos Aires. Both are jointly owned by Austin and local interests. Austin-Anderson (Australia) Pty., Ltd. is headquartered in Sydney and also has a Melbourne office. The Argentine firm is Austin-Graziani, S. A.

• **Chemical-plant expansion** – Atlas Powder Co. plans a $17-million plant at its Atlas Point installation near Wilmington, Del. Construction starts in about two months.

• **Big job abroad**—Morrison-Knudsen International Constructors, Inc. won a $38-million contract for design and construction of a urea plant in Indonesia.

• **Design contract let**—Modjeski & Masters, Harrisburg engineers received a $147,820 contract for preliminary design of 10.8 miles of the $300-million Delaware Expressway in Philadelphia.

• **Bright outlook** – Pennsylvania's 1961 public and private building outlays will total $714 million, according to William L. Batt, Jr., state Secretary of Labor and Industry.

• **Smaller outlays** – Allegheny Ludlum Steel Corp., Pittsburgh, plans outlays of $8 million this year compared to $17 million in 1960 and $5.5 million in 1959.

• **A lot of cement**—Cost of proposed cement plant at Ravena, N. Y., near Albany, is estimated at $64 million by co-owners, Cerro Corp. and Newmont Mining Corp., both of New York City. Initial designed capacity is 10-million barrels a year, largest in the world.

• **A start**—Oregon's Board of Higher Education has approved preliminary plans for a $2.3-million library building at Oregon State College, Corvallis. Architects are Hamlin & Martin of Eugene, Ore.

• **German-French to German-Dutch** —The government of West Germany has announced plans for a $400-million, 190-mile four-lane highway on the left bank of the Rhine. It will run from Speyer, near the French border to the Dutch border near Kleve or Venlo.

• **Engineers sue**—Palmer & Baker Engineers, Inc., New Orleans, seek $847,912 in damages from Dade County, Fla., for work done on a highway project. The engineers charge the project has been abandoned, but county officials deny the claim.

• **Colorado speed-up**—Gov. Steve McNichols has ordered work started on a $9.6-million building program at the state hospital in Pueblo.

• **Highway bonds approved**—Voters in Santa Clara County, Calif. said "yes" to a $70-million bond issue for 50 miles of expressways scheduled for construction in the next eight years. Construction starts next year.

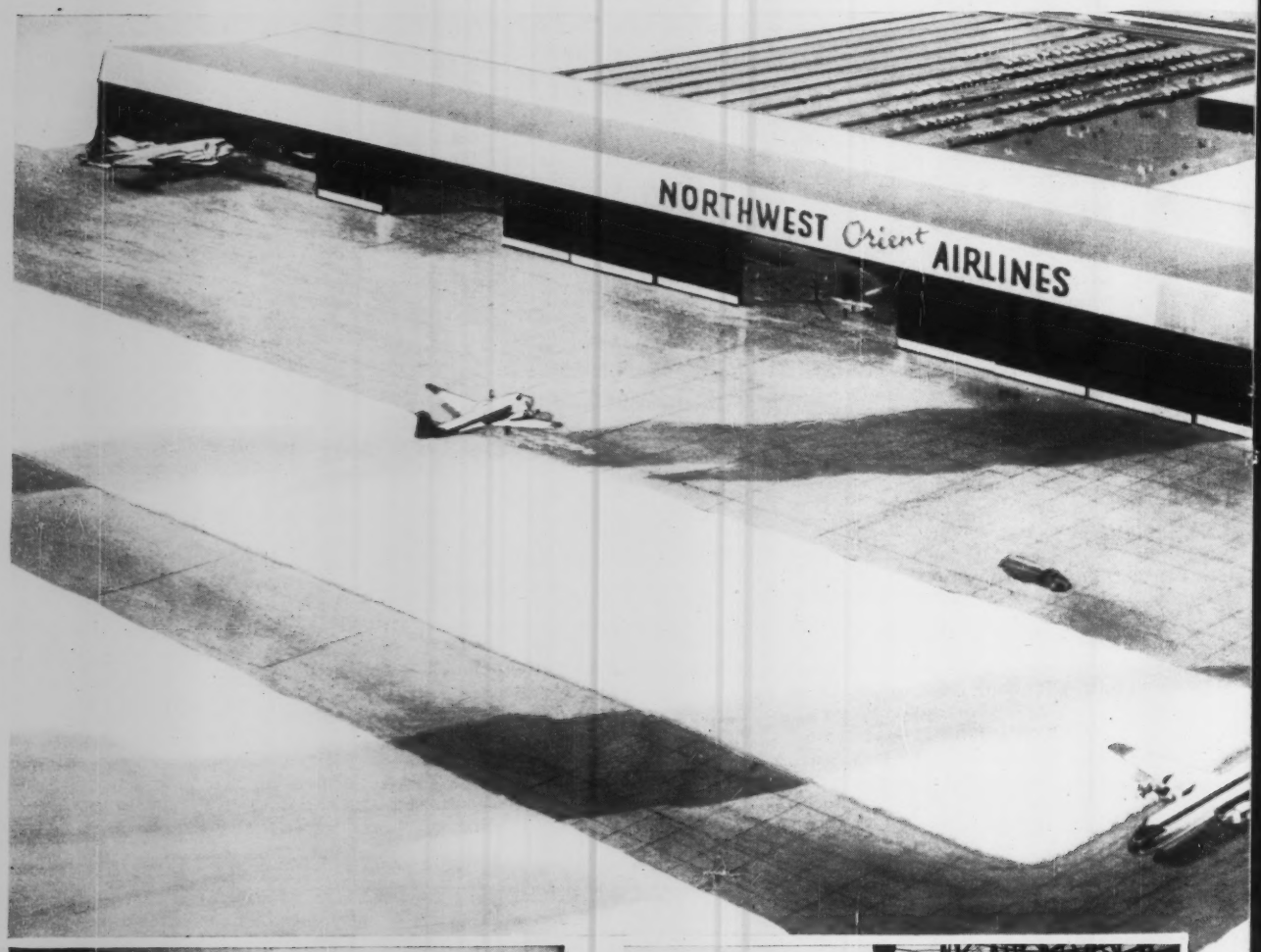
• **Power**—Delaware Power & Light Co. construction outlays in the next five years will total $115 million, says A. T. Gardner, president.

• **Turnpike sues**—The Pennsylvania Turnpike Commission is suing three insurance companies for $6.5 million on performance bonds posted for construction of the northeast extension of the turnpike. The suit charges that Manu-Mine Research and Development Corp., Reading, holder of the contract to flush and fill mine voids in the roadway to prevent collapse, failed to "perform its obligation of its contract."

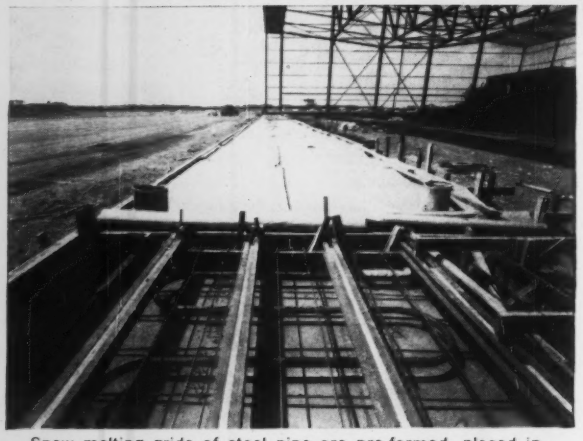
• **University expansion** – University of San Francisco plans to start construction this year on two buildings at an estimated cost of $4 million. A $1-million Law School building will be started in May. Later in the year, a $3-million Science Center will get under way.

• **Bond election coming**—Voters of Phoenix, and Maricopa County, Ariz. will act May 23 on bond proposals totaling $175 million. Phoenix wants authority to issue $150 million worth of bonds for municipal improvements; Maricopa County wants $25 million to finance construction of a county building and hospital.

• **Design contract awarded**—Urbahn, Brayton & Burrow of New York City and Brust & Brust of Milwaukee, received the architectural contract for a $22-million Veterans Administration hospital in Milwaukee. Contract calls for submission of bids by May 15, 1962.



In hangars and shops, steel pipe panels carrying hot water provide comfortable warmth, at all levels, for the overhauling and maintenance crews.



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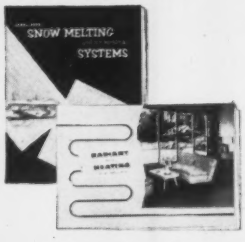

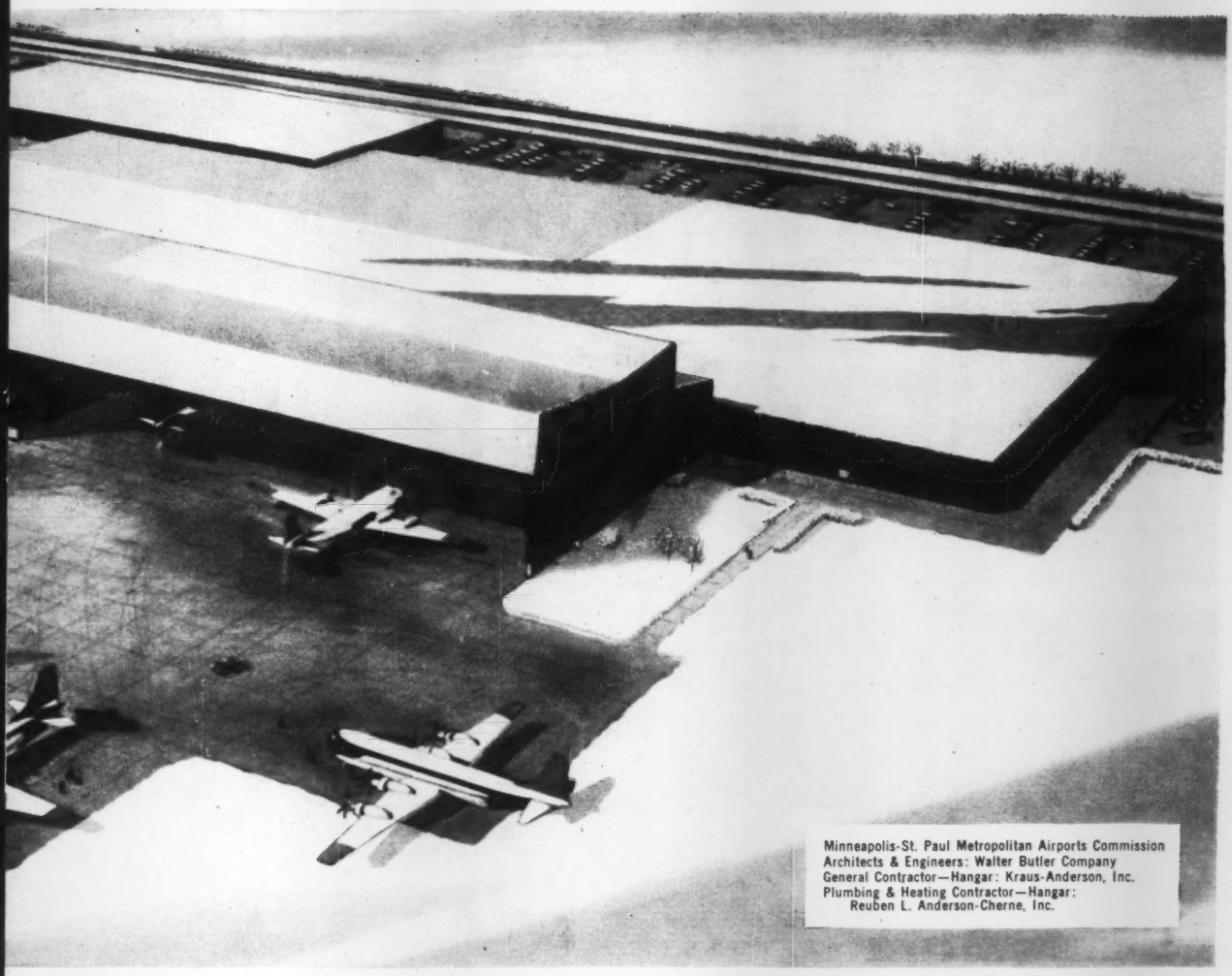

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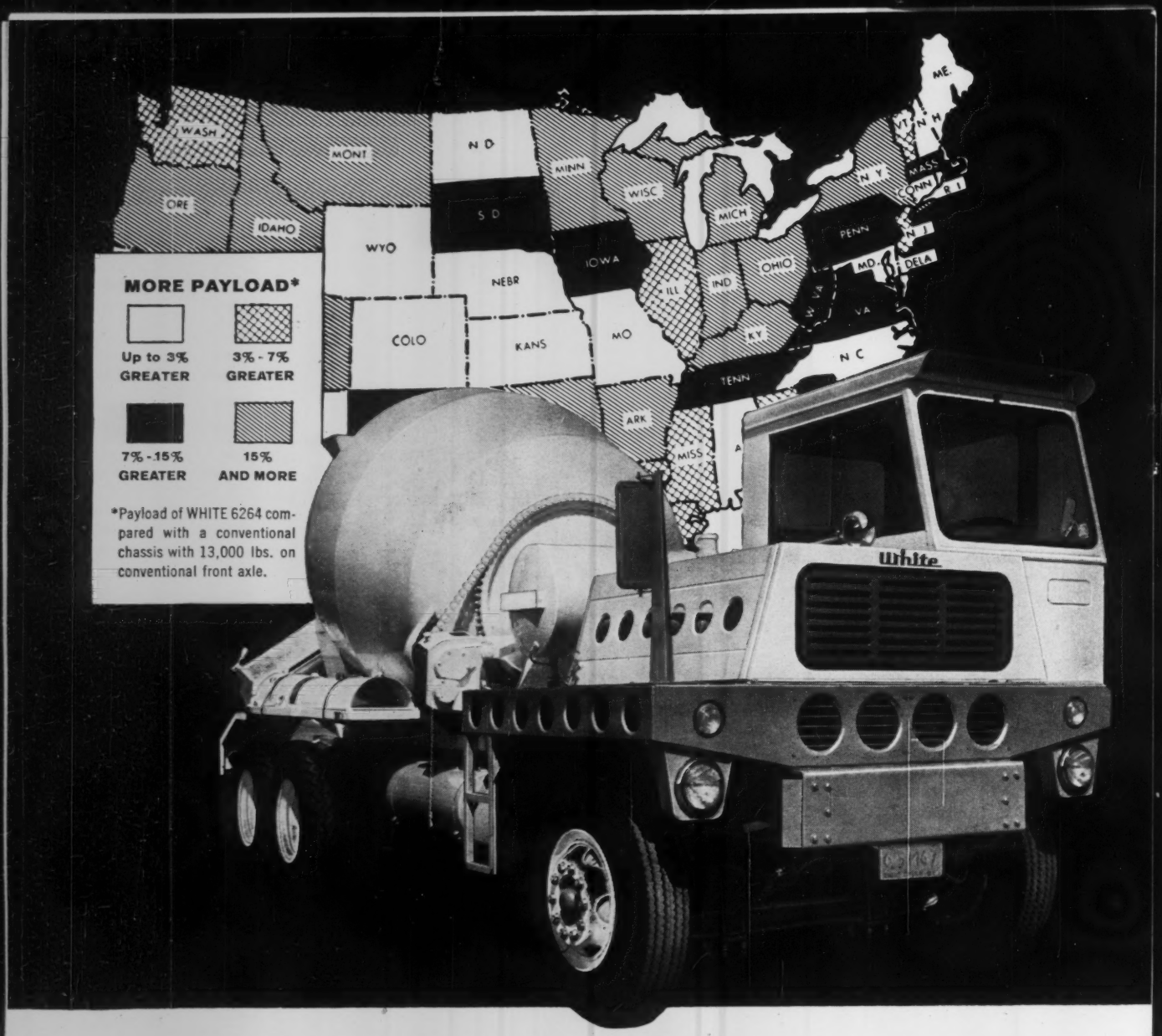

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Picketing Bill Loses Its Steam

- **Committee hearings set for next week are not expected to improve the bill's dim prospects.**
- **Measure faces stiff opposition, a legislative split in the AFL-CIO and wide confusion.**

Present indications are that the construction industry's situs picketing bill stands little chance of congressional approval this year despite the fact that it has the strong support of President Kennedy. Through its long history, the measure has bumped against stiff opposition from employer groups in and out of the construction industry. This year it faces three other obstacles, each one almost insurmountable.

- There is no agreement so far on definitions, and no meeting of minds on what the bill would do.
- There is a strong feeling that it is illogical to try to stimulate a sagging economy, on the one hand, and to disrupt it on the other.
- Efforts of the AFL-CIO industrial unions to revamp the bill are compounding the confusion the bill has already generated and threaten to destroy the legislative momentum the bill has gathered over the years.

The building trades have been pushing this bill—the most contentious piece of labor legislation ever dropped in Congress' lap—for 10 years. Long a source of friction between labor and management, the situs picketing bill now has become an irritant within the labor movement itself and a possible drag on further progress toward labor unity by the AFL-CIO.

Hearings on the bill (H. R. 2955) get under way next week in the Perkins labor subcommittee of the House Education and Labor Committee. The House bill is sponsored by Rep. Frank Thompson, Jr. (D., N. J.); a companion bill in the Senate (S. 640) is sponsored by Sen. Pat. McNamara (D., Mich.).

The bill has created a controversy ruled by passion rather than reason because it relates to the right to strike and destroys some of the protection the law now affords against secondary boycotts. The inevitable result is a general confusion that obscures the two things the bill is all about—protection of union wages and working conditions, and equal protection under the law.

Behind the bill is a 1951 U. S. Supreme Court decision, called the Denver case, which broadly construed the law's ban on secondary boycotts. The decision involved a strike against the use of a nonunion subcontractor on a union job. The court called the strike an illegal boycott. That decision, the building trades contend, has made it difficult if not impossible for them to strike a job on which several contractors are working if the dispute is with only one of the contractors.

The unions claim the Denver decision has deprived them of the right to strike to protect their wages. As a result, they say, the law unfairly gives them less protection than it gives unions in other industries where the problem of multiple-employers does not exist.

The situs picketing bill was drafted as an answer to these two complaints. It simply prevents the courts from pinning the label of "secondary boycott" on a strike by a construction union against one of several contractors at a construction site if the strike grows out of a lawful labor dispute relating to wages, hours or working conditions at the site. The fact that other employers at the site would be hit by the strike is brushed aside on the theory that they are not the "neutrals" the law seeks to protect. President Eisenhower used this reasoning in his endorsements of the bill.

This year, one new clause has been added to the bill to make it more palatable. That clause exempts strikes at military sites, including missile and space vehicle projects, from the bill unless the striking union gives a 10-day notice of intent to strike to all employers at the site, to the contracting agency and to the Federal Mediation and Conciliation Service. The clause is now fortified by the building trades' recent pledge against missile base strikes and by the National Disputes Plan negotiated with the National Constructors Association.

Until now, the bill has always been a construction union measure. The Thompson and McNamara bills, for example, speak only in terms of construction industry employers and their workers. The industrial unions are now trying to change all that—and in doing so are probably giving the picketing bill the kiss of death.

This aspect of the case also appeals to passion because it is closely tied to the deep-seated jurisdictional conflict between craft and industrial unions over in-plant construction work.

The industrial unions claim that they are also victims of the Denver case. They want the situs picketing bill broadened to protect their strike rights.

They say the Denver case is being used to prevent them from picketing the premises of their own employers. One of the examples they cite is the General Electric Appliance Park case, which is now before the U. S. Supreme Court. In that case, a plant union, in the course of a normal dispute with G.E., included in its picketing a plant gate used only by outside contractors doing work for G.E. inside the plant. The construction gate picketing was knocked down by the lower court as a secondary boycott.

No agreement had been reached as of last week between the Building Trades and Industrial Union Departments on a joint approach to the bill. Several unfruitful meetings were held and the chances of a compromise were reported to be slim.

The IUD was prepared, at the time of the meetings, to push for an amendment to give industrial unions the right to picket an entire plant, including gates reserved for outside contractors. Acceptance of such a proposal by the building trades would be prejudicial to them in their fight to prevent further loss of in-plant construction work to industrial unions. Rejection of the proposal means confronting Congress with a divided labor movement.

The mere fact that the split has occurred is giving new ammunition to those who already oppose the bill. An old argument against the bill is that as soon as you give one union group something, others will want it and the law's protection will soon be whittled away.

The principal theme expected to be developed by the bill's opponents at the hearings is that the bill is actually a pig in a poke.

The opposition contends that the language of the bill is too vague. It says the bill would result in an inordinate increase in union power and in labor strife generally.

(Please turn the page)

The opponents claim, for example, that the bill would allow construction unions to cripple the defense effort, extend their disputes to factories, promote product boycotts, retard the introduction of new building techniques and materials, engage in jurisdictional disputes, increase construction costs and restore the closed shop.

In reply, the building trades call such arguments "wild" and purposely intended to confuse and deceive. They insist the bill's impact is limited to the construction industry, to contractors and construction workers, to construction sites and to lawful disputes. They deny it will affect manufacturers, or legalize product boycotts or turn what are now unlawful strikes into lawful ones. All the bill does, they say, is give them the right to strike to protect their wages and working conditions at construction sites.

Employers argue that the building trades already have this right under the rules laid down in what is known as the Moore Drydock case. But the unions contend the rules, which limit the mode and place of picketing, do not fit the construction industry.

The Kennedy Administration has lined up behind the building trades. President Kennedy consistently supported the bill as a senator and has personally endorsed it as President. Labor Secretary Arthur Goldberg has followed suit, emphasizing the fact that the Denver case did abridge the right to strike. He says the building trades are now on the short end of the stick under the law and that the bill should be passed as a matter of "fairness."

The merits of the case are apt to carry little weight with a Congress that is proving both independent and conservative. In the last analysis, the big question before the subcommittee next week is whether the economy should be exposed to more strikes—even if the right to engage in the strikes is as circumscribed as the building trades insist.

Memphis Union Agrees to Freeze Wages

The recession seems to be having little effect on current negotiations with other building trades

Cement finishers Local Union No. 521 in Memphis, Tenn., has agreed to forego a wage increase this year in negotiations concluded with the Memphis Chapter of the Associated General Contractors. But elsewhere, collective bargaining in the construction industry is producing wage increases of 10 to 15 cents an hour each year under long-term labor contracts.

The Memphis wage freeze for the cement finishers is effective in 15 counties in Tennessee, Mississippi and Arkansas. It means continuation of the present scale of $3.15 an hour for another year.

Work rule changes in the cement finishers' contract, however, do affect wages. The contract provides for show-up pay for two hours unless the lack of work is due to inclement weather. A cement finisher who works less than four hours is now entitled to four hours pay. If he works more than four hours but less than eight, he will get paid for eight hours.

The Memphis AGC is still negotiating with five other trades—carpenters, iron workers, teamsters, operating engineers and laborers.

Meanwhile, the Building Trades Employers' Association in Springfield, Mass., has concluded new three-year, 33.5-cent labor agreements with the Carpenters District Councils of Pioneer Valley and Holyoke. Annual increases under the first contract are 10, 11.5 and 12 cents. Wage increases under the second contract are 9, 10 and 11 cents a year. The Holyoke carpenters will also get two health and welfare increases that total 3.5 cents, pushing the health and welfare contribution to 11 cents in 1962.

The BETA is still negotiating with several other trades that are working under interim agreements.

In Rochester, N. Y., operating engineers working at concrete plants operated by members of the Producers Association in Rochester, N. Y., have negotiated a three-year contract that provides for a wage boost of 40 cents an hour over the life of the contract.

Neighboring laborers working for members of the Rochester Aggregates & Excavators Association have also accepted a three-year, 40-cent contract. The laborers, whose old scale was $2.87, will get a 12-cent increase this year, 13 cents next year and 15 cents in 1963. Their new contract also includes improvements in hospitalization and pension benefits.

Operating engineers in Dallas, have settled for 12.5 cents a year in a two-year contract.

Bigger concessions are being sought for some 7,000 carpenters in the metropolitan area of Philadelphia. In their negotiations with the General Building Contractors Association, the carpenters are asking for a 36.5-cent raise in a two-year contract, a shorter workweek, larger pension and welfare benefits, two paid holidays and a 2% vacation contribution.

The Philadelphia carpenters, who now work an eight-hour day, are suggesting that a seven-hour day be established by 1962 by shortening the workday 30 minutes each of the two contract years.

Still unresolved last week was a contract dispute between 1,500 Connecticut operating engineers and the Connecticut Road Builders' Association. The union's three-year labor contract has expired. And a strike has been authorized unless the engineers' demands for higher wages, better working conditions and more job security are met.

Under the old contract, pay scales for the engineers ranged up to $3.90. Power shovel, crane and derrick operators received $3.80 an hour.

Labor in Brief . . .

• Powers to Joint Board—Joseph T. Powers, executive vice president of the plasterers union, has been appointed a member of the National Joint Board for the Settlement of Jurisdictional Disputes.

• A friend in need—The teamsters union in Hawaii has rejoined the state's AFL-CIO Building and Construction Trades Council. The move aligns the teamsters with the AFL-CIO in fighting efforts of the longshoremen's union to organize Hawaiian construction workers.

• Strike halted—Operating engineers in Detroit interrupted work on a $2.2-million school project last week in a dispute over the right to operate compressors used by painters in spray painting. The engineers international union ordered the pickets withdrawn pending processing of the dispute.

• Convention scheduled—July 3 is the date set for the teamster union's special convention at which James Hoffa will presumably be reelected president. The meeting will be held at the Deauville Hotel, Miami.

Soil Saver applied to highly critical center of steep grade median strip.
Stabilizing grass growing through Soil Saver heavy jute mesh.
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NLRB Approves Contracting Out

Labor board rules award of a maintenance contract to Fluor did not violate industrial union rights

Maintenance by contract got a boost from the National Labor Relations Board last month.

The board ruled that an industrial concern whose maintenance work has been done by members of an in-plant union can switch to the contract method for business reasons without first consulting or bargaining with the in-plant union as long as there is no chicanery involved.

The case stemmed from a 1959 decision by Fibreboard Paper Products Corp. in Emeryville, Calif., to contract its maintenance work to Fluor Maintenance, Inc.

When the Fluor contract went into effect, the United Steelworkers of America, whose members had been doing the maintenance work, picketed the plant and filed unfair labor practice charges against the company.

The union charged that the company had dismissed about 50 of its former maintenance workers in order to oust the steelworkers union. It also claimed that Fibreboard had refused to bargain with the union about the Fluor contract.

Facts developed at the hearing showed that the company had made the switch after a careful study that indicated the company could save some $250,000 a year under the contract method. There were no irregularities in the employee terminations. The terminations coincided with the expiration of the steelworkers' labor contract and the union did have advance notice of the contemplated change.

The NLRB trial examiner found that Fibreboard had made the switch to the contract method for business reasons and in good faith. The board agreed and dismissed the charges.

"It goes without saying," the trial examiner argued, "that an employer's right to close down his plant, or to lay off his employees or otherwise to alter his employees' tenure and working conditions, is circumscribed by the (Taft-Hartley) Act only insofar as its exercise does not impinge upon the employees' rights to organize and to engage in other concerted protected activities. Thus, it is well settled that an employer is free to suspend operations for business reasons which are not concerned with protected employee activity."

In upholding the conclusions of the trial examiner, the NLRB said there is no inference that Congress intended "to compel bargaining concerning basic management decisions, such as whether and to what extent to risk capital and managerial effort."

The board said there is no merit to the proposition that a management decision to cease an operation for economic reasons is a mandatory subject of bargaining. Under existing law, it observed, "the establishment by the board of an appropriate bargaining unit does not preclude an employer acting in good faith from making changes in his business structure, such as subcontracting arrangements, without first consulting the representatives of the affected workers."

Both the trial examiner and the board also noted that after the switch there was no one left in the old maintenance unit for the union to represent. The company, they said, had no obligation to bargain for a new contract because there were no interests left for the union to represent or protect.

One of the board members, John H. Fanning, disagreed with the majority. He said Fibreboard violated the law when it unilaterally contracted out the work. His reasoning was that abolition of jobs under the contract method was a proper subject of bargaining and that it was an unfair labor practice to refuse to bargain on it.

The U. S. Supreme Court settled the issue last year, Mr. Fanning said, when it ruled that a railroad was required by law to bargain with telegraphers over station shutdowns that would abolish their jobs.

Contractors in Ottawa See Strength in Unity

All members of the Ottawa Builders Exchange are being asked to post a $1,000 bond to guarantee that they will not break with other members in pending labor negotiations. The goal is a united front in collective bargaining.

Most of the labor contracts with union building tradesmen in eastern Canada are coming up for renegotiation in the next few months.

One spokesman for the industry has suggested that unions accept a wage cut of up to 10 cents an hour as a means of cutting costs and of stimulating more business for the depressed construction industry.

OFFICIAL PROPOSALS

Bids: April 20, 1961

Power Authority of the State of New York

Niagara Power Project
Advertisement for Proposals
FOR
Grading, Topsoiling and Seeding, Waterways, Work Sections I & II Station 53+55 to Station 82+00 and Overburden Stockpile South of Porter Road in Niagara Falls, Niagara County, New York, Specification No. PA-N-23046, Niagara Contract No. N37

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for grading, topsoiling and seeding in the Waterways, Work Sections I & II, from approximately Station 53+55 to Station 82+00 and overburden stockpile south of Porter Road in Niagara Falls, Niagara County, New York until 10:30 A.M. Eastern Standard Time on the 20th day of April, 1961, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are: Estimated:

76 acres, Grading
76 acres, Topsoiling, 6 inches thick
76 acres, Preparing seed beds, placing limestone, fertilizer, seeding, mulching and maintenance

All work shall be completed on or before July 1, 1962.

Plans, specifications and proposal forms for the work may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, specifications and proposal forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the information for bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the total of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-N-23046

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5566) will be received at San Angelo, Texas, until 10 a.m., Central Standard Time, May 4, 1961, for furnishing labor and materials for Earthwork, Concrete Lining and Structures, Main Canal, Station 0+00 to Station 838+59, San Angelo Project, Texas. Location near San Angelo, Texas. Principal items are: 815,000 cu. yds. of excavation; 19,400 cu. yds. of concrete; furnishing and installing 73 slide gates; and other work. Completion time 635 days. For particulars, address Bureau of Reclamation, Box 271, San Angelo, Texas; P. O. Box 1609, Amarillo, Texas; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: April 27, 1961

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, CANAL LAW, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 27th day of April 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. FULLER, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rte. 85)	FAC 61-6 FARC 61-25	City of Albany: Crosstown Rte. Art. Highway, (Krumkill Rd. to Washington Ave.) Slingerlands–Albany, S.H. 5237 Proj. U-392(12)	1.96 (4.59 Acc.)	9" Cem. Conc. Pavt., 2 @ 24' Var.= 1.41 Mi. Grad., Drain., Misc. Work = 0.55 Mi., Acc.= 1.91 Mi. Cem. Conc. Pavt., 2.11 Mi. Asph. Conc. Ty. 1A & 0.57 Mi. Grad., Drain., & Misc. Work, H.G.S. I-Beam, 4 Sps., 193.5' Tot., H.G.S. Twin Comp. I-Beam 3 Sps. Ea., 142.02' Tot., 4 H.G.S. Comp. I-Beam, 4 Sps. 187.70' Tot., 5 Sps. 250.81' Tot., 5 Sps. 396.49' Tot., 2 Sps. 139.35' Tot.	$275,000 Plans $10	$5,037,000
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee St., Utica 1, N. Y.						
Herkimer (Rte. 5S)	R.C. 61-49	Stone House-Indian Castle, S.H. 8417; Little Falls-Montgomery Co. Line, S.H. 831	3.19	Asphalt Conc., Type 1A	$7,100 Plans $5	129,000
Madison (Rte. 13)	FARC 61-56	New Woodstock-Cazenovia, S.H. 8024, Cazenovia Vill. Pt. 1, S.H. 5675, Cazenovia Vill. Pt. 1, S.H. 5675 Proj. S-54(2), F-470(20)	5.25	Asphalt Conc. Ty. 1A = 5.23 Mi. Misc. Work = 0.02 Mi.	$45,000 Plans $5	815,000
Oneida, Herkimer, & Madison (Rtes. 274, 12C, 2S, & 46)	R.C. 61-43	Holland Patent-Frenchville, Pt. 1, S.H. 1545; Whitesboro-Trenton, S.H. 5325; Herkimer-Middleville, S.H. 460; Middleville Vill. S.H. 869, Oneida-Munnsville, Pt. 2, S.H. 1217	....	Tree Removal	$500 Plans $5	9,000
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington Street, Syracuse, New York						
Cayuga (Rte. 34)	FARC 61-53	Fleming-Scipio, Pt. 2, S.H. 1327; Fleming-Scipio, S.H. 753 Poplar Ridge-Fleming, S.H. 5244; Fleming-Auburn, S.H. 5012; Fleming-Auburn, S.H. 5012 Proj. F-1155(2), S-673(2)	6.86	Asphalt Conc.= Ty. 1A	$55,000 Plans $5	990,000
Cayuga (Rte. 38)	R.C. 61-42	Victory-North Victory, S.H. 8407	4.06	Asphalt Conc., Type 1A	$12,000 Plans $5	219,000
Onondaga (Rte. 31)	FARC 61-58	Weedsport-Jordan, Pt. 2, S.H. 5630; Jordan Vill.: No. Main St. S.H. 1505; Jordan-Baldwinsville, Pt. 1, S.H. 1506 Proj. F-185(6)	4.15	Asphalt Conc. Type 1A; Twin Reinf. Conc. Closed Box Br. 38.1' Sp., Twin Reinf. Conc. Open Box Br. 27.3' Sp.	$50,000 Plans $5	916,000
Oswego (Rte. 3)	R.C. 61-48	Mexico-Selkirk State Park, Pts. 1 & 2, S.H. 8458; Port Ontario-Jefferson Co. Line, S.H. 8420	14.78	Asphalt Conc. Type 1A	$40,000 Plans $5	709,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe (Rte. 47 & Int. Trg. Rte. 490)	FITS 61-12 FATS 61-13	Interstate Rte. Conn. 580 (FISH 56-9 & FISH 58-16) Rochester-Bushnell Basin, Pt. 2 & 3; Rochester Outer Loop (FASH 58-17, FAC 59-8, FASH 59-14) (East Ave. to Winton Rd.) Winton Rd.-Sea Breeze, Pt. 2 (FASH 56-7) Proj. I-490-2(24), U-1097(7)	4.75	Traffic Signs and Delineators	$16,000 Plans $5	112,000
Monroe	M 61-4A	City of Rochester: Sector Gate 2, Court St. Dam on Genesee River	....	Cleaning & Painting Sector Gate 2	$350 Plans $5	6,600
Monroe	LOSP 61-1P FAC 61-8P	Lake Ontario State Parkway (Dewey Ave.-Rochester City Line), Rochester City: Lake Ontario State Parkway Art. Highway, (Rochester City Line—Lake Ave.) Proj. U-1141(3)	1.76 (0.93 Acc.)	Asphalt Conc.= 2.61 Mi.; Misc. Work = 0.08	$30,000 Plans $5	545,000
Ontario (Rte. 21)	FARC 61-55	Bristol, S.H. 187; Cheshire-McJannetts Hill, S.H. 639 Proj. S-387(2)	2.51	Asphalt Concrete	$11,700 Plans $5	213,000
Wyoming (Rte. 19)	FARC 61-63	Warsaw-Gainesville, S.H. 5400 Proj. F-380(8)	0.09	Asphalt Conc.= 0.07 Mi.; Misc. Work = 0.02 Mi.; Prestressed Conc. Beam Br. 53' Sp.	$13,000 Plans $5	228,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Chautauqua (Rte. 17)	FAC 61-10	City of Jamestown: North-South Art. Highway, (Washington St.-Fluvanna Ave.) Proj. U-561(4)	1.89	Asphalt Conc. Type 2A	$56,000 Plans $5	983,000
Chautauqua (Rte. 60)	FARC 61-62	Pratt Corner-Sinclairville, S.H. 1471 Proj. F-1117(3)	0.66	Asphalt Conc.= 0.63 Mi.; Misc. Work = 0.03 Mi.; Triple Reinf. Conc. Closed Box, 3 Sps. 85.16' Tot.	$24,000 Plans $5	443,000
Erie & Niagara	M 61-5	Webster St. Bridge E 248 Over Erie Canal; Tonawanda to N. Tonawanda	....	Cleaning and Painting Twin Bascule Bridge	$600 No Plans 2 Proposals $2	11,500
Erie (Rte. 75)	R.C. 61-45	Athol Springs-Hamburg, S.H. 1067	1.83	Asphalt Conc.= 1.82; Misc. Work = 0.01	$10,000 Plans $5	187,000
Erie (Int. Trg. Rte. 290)	FIPLE 61-1	Interstate Rte. Conn. 590 Powerline Expressway Sect. 2, Contract 1, (Millersport Highway to Main St.) Proj. I-290-1(41)	3.34 (6.50 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var.= 3.14 Mi.; Misc. Work = 0.20 Mi.; Acc.= 4.18 Mi. Cem. Conc. Pavt.; 2.17 Mi. Asph. Conc.; 0.15 Mi. Misc. work; 3 HGS Comp. I-Beam; 3 Sps. 181.22' Tot.; 4 Sps. 316.7' Tot.; 4 Sps. 226.68' Tot.; HGS—Plate Girder, 2 Sps. 214.53' Tot.	$400,000 Plans $10	7,356,000
Erie (Rte. 5)	FATS 61-10	Lake Shore Lackawanna City, S.H. 5019; Athol Springs-Walden Cliffs, S.H. 5407 Proj. U-750(24)	1.32 (1.10 Acc.)	Traffic Signs & Delineators	$750 Plans $5	13,000
Erie (Rte. 5)	R.C. 61-44	Southwestern Boulevard, Pt. 9, S.H. 1852	2.02	Asphalt Concrete	$12,000 Plans $5	218,000
Niagara (Rte. 425)	R.C. 61-61	North Tonawanda-Shawnee, S.H. 713; Shawnee-Cambria, S.H. 729	6.06	Asphalt Concrete Type 1A	$43,000 Plans $5	790,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton (Rte. 22)	R.C. 61-38	Plattsburg-Mooers, Pt. 1, S.H. 138; Plattsburg-Mooers, Pt. 3, S.H. 260	7.69	Asphalt Concrete Type 1A	$20,000 Plans $5	364,000
Clinton (Rte. 34B)	R.C. 61-39	Rouses Point Village, S.H. 5228, Rouses Point-Canadian Line, S.H. 5337	2.34	Asphalt Concrete Type 1A	$7,000 Plans $5	125,000
Clinton (Rte. 9B)	R.C. 61-40	Chazy-Rouses Point, S.H. 5199	3.58	Asphalt Concrete Type 1A	$11,500 Plans $5	214,000
Clinton (Rte. 191)	R.C. 61-41	Altona-Obers Corners, S.H. 1488	0.49	Asphalt Concrete Type 1A	$5,000 Plans $5	90,000
St. Lawrence, U.S. Grenville, Canada	OBA 61-7	Ogdensburg Bridge: Canadian & U. S. Approaches	2.40	Traffic Signs	U. S. $1,300 Plans $5	U. S. 23,000
Lewis (Rte. 26)	R.C. 61-47	Ava-West Leyden Pt. 2; West Leyden-Constableville Pt. 1, S.H. 8305; Constableville-Lyons Falls, Pt. 1, S.H. 1600	3.44	Asphalt Concrete Type 1A	$9,000 Plans $5	152,000

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OFFICIAL PROPOSALS

OFFICIAL PROPOSALS

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OFFICIAL PROPOSALS

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Rd., Poughkeepsie, New York						
Dutchess	FAC 61-11	North-South Arterial Highway City of Poughkeepsie Proj. U-322(20)	2.30	Demolition	$11,000 Plans $5	193,000
Orange	FAC 61-7	City of Newburgh: South Street Arterial Highway Proj. U-543(10)	1.88	Asphalt Concrete = 1.88 Mi.; H.G.S.-1 Span-Reinf. Conc. Rigid Frame—68.7'	$70,000 Plans $5	1,280,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 26)	R.C. 61-50	Whitney Point Village-Hickory St., S.H. 1612; Whitney Point-Upper Lisle, S.H. 858; Upper Lisle-Willet, Pt. 1, S.H. 9034	2.73	Asphalt Concrete	$7,000 Plans $5	121,000
Delaware	BWS 61-1	City of New York Board of Water Supply, Road No. 1 (Cannonsville Reservoir) City of New York; Board of Water Supply, Road No. 2 (Cannonsville Reservoir)	7.07 (1.89 Acc.)	Asphalt Conc. = 8.23 Mi. Grad., Drain., Temp. Conns. = 0.73 Mi.; Twin Reinf. Conc. Closed Box Br. 34.15' Sp.; Triple Reinf. Conc. Closed Box Br. 27.1' Sp.	$200,000 Plans $5	3,638,000
Delaware (Rte. 10)	R.C. 61-51	Hobart-Stamford, S.H. 952	4.65	Asphalt Concrete	$17,000 Plans $5	302,000
Otsego (Rte. 28)	R.C. 61-59	Richfield Springs-Schuyler Lake, S.H. 5037; Richfield Springs-Schuyler Lake, Pt. 2, S.H. 5659; Schuyler Lake-Cooperstown, Pt. 1, S.H. 5686	6.62	Asphalt Concrete	$20,000 Plans $5	360,000
Schoharie (Rte. 10)	R.C. 61-52	Stamford-Summit, S.H. 8201	8.28	Asphalt Concrete	$27,000 Plans $5	482,000
Sullivan, N. Y. Wayne, Pa.	I. BR 61-1	Callicoon Interstate Bridge	0.72 (0.16 Acc.)	Asphalt Conc. Type 1A; Welded Plate Gird. Br., 7 Sps. 135.4' Each	$55,000 Plans $5	967,000
DISTRICT No. 10, A. M. Sabr, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx (Int. Trg. Rte. 278)	FIBETS 61-1	Interstate Rte. Conn. 516 Bruckner Expressway (Sect. 1, Contract 5.) St. Ann's Ave. to East 135th St. Proj. I-278-1(62)	0.29	Traffic Signs and Delineators	$2,700 Plans $5	50,000
Kings	BP 61-63	Beach Protection at Coney Island	....	Artificial Beach Nourishment	$50,000 Plans $5	875,000
Nassau (Rtes. 25, 106, 107)	FATS 61-11	Massapequa-Glen Cove, S.H. 9017; Jericho-Oyster Bay, S.H. 9021; Jericho Turnpike, S.H. 9020; Jericho Turnpike-Plainview Rd., S.H. 436 Proj. US-377(7), US-500(5), U-1000(11)	3.08	Traffic Signs and Delineators	$7,000 Plans $5	130,000
Queens (Int. Trg. Rte. 78)	FICE 61-1 FAVWE 61-1	Interstate Rte. Conn. 513 Clearview Expressway (Hillside Ave. to 73rd Ave.) Van Wyck Expressway Extension (57th Avenue to Union Turnpike) Project EI-78-1(61), U-1085(19)	3.83 (7.81 Acc.)	9" Cem. Conc. Pavt. = 3.10 Mi.; Colored Cem. Conc. Pavt. = 2.36 Mi.; Asph. Concrete = 1.19 Mi.; Misc. Work = 0.22 Mi.; Embankment and Surcharge = 4.77 Mi., HGS Plate Gird. 124'± Sp.; 2 HGS Comp. Beam 1 Sp. 83'±, 2 Sps. 122'± Tot.; 1 Equestrian Underpass Overpass-Simple Beam, 2 Sps. 69'± Ea.; HGS—4 Level Structure Plate Girder, 4 Sps. 415' Tot.; WF Beam 4 Sps. 282' Tot.; Plate Girder 2 Sps. 248' Tot.	$675,000 Plans $10	12,589,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: May 2, 1961

The Lehigh-Northampton Airport Authority

NOTICE TO CONTRACTORS

The Lehigh-Northampton Airport Authority will receive sealed Proposals for the demolition and reconstruction of 4000 feet of an existing runway and for the extension of an existing terminal apron. Proposals will be received by the undersigned until 1:30 P.M. (E.D.S.T.) May 2, 1961 at the Office of the Chief Clerk of the Lehigh County Commissioners, Court House Annex, 523 Hamilton Street, Allentown, Pa., and will be publicly opened after 1:40 P.M. (E.D.S.T.) of the same day.

Copies of the Plans, Specifications and Proposal Forms can be obtained at the office of G. Edwin Pidcock Co., Consulting Engineers, 126 North Ninth Street, Allentown, Pa., upon payment of Thirty-Five ($35.00) Dollars for each set. Any Bidder, upon returning such set in good condition within ten (10) days after the opening of the Proposals, will be refunded Twenty ($20.00) Dollars of his payment.

The work under this contract shall be done in accordance with the "Standard Specifications for Construction of Airports" (Federal Aviation Agency) as published by the United States Government Printing Office in June, 1959. Copies of these Specifications can be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., at a price of $2.75 each.

Each Bidder must deposit with his Proposal, a certified check or surety company's bid bond in an amount of not less than five (5) percent of the Total Alternate Bid 1 as defined in the Instructions to Bidders.

Proposals must be submitted in duplicate on the prescribed forms provided and in accordance with the Instructions to Bidders. No Bidder may withdraw his Proposal within thirty (30) days after the actual date of the opening thereof. The Lehigh-Northampton Airport Authority reserves the right to waive any informalities in, or to reject any or all Proposals.

The minimum wages paid all labor employed on this project shall be as tabulated in the Specifications and as approved by the Secretary of Labor of the United States.

Raymond H. Jackson
Secretary, Lehigh-Northampton Airport Authority
ROBERT H. HOLLAND, Solicitor

Bids: May 31, 1961

Virginia State Ports Authority

NOTICE TO CONTRACTORS

The Virginia State Ports Authority will receive sealed bids at its office on the 16th Floor, Maritime Tower, Norfolk, Va., until 2 P.M. (EST) May 31, 1961, at which time and place they will be publicly opened and read, for the fabrication, delivery, and installation of two Gantry Mounted Revolving Cranes on a pier to be constructed at Lamberts Point in the City of Norfolk.

Plans and specifications are on file and available for inspection at the office of the Virginia State Ports Authority, in Norfolk, Va., New York, N. Y., or Chicago, Ill., at the offices of Lockwood Greene Engineers in Spartanburg, S. C., or New York, N. Y.; at the office of Blackburn and Blauvelt in Richmond, Va.; or at the office of the Chief Engineer, Norfolk and Western Railway Company, Roanoke, Va.

Contractors interested in bidding on this work should make application to Lockwood Greene Engineers, 1020 Montgomery Building, Spartanburg, S. C., enclosing a deposit in the amount of $50 for necessary bidding material. This deposit will be returned to any bidder if plans and specifications are returned in good condition. Additional copies of the plans and specifications may be purchased from the Engineers for the cost of reproduction.

6% bid bond will be required from all bidders. Performance and payment bond will be required from the successful bidder. It is expected but not guaranteed, that contract will be awarded to the lowest responsible bidder approximately 120 days after the date of opening above specified.

Bids: April 25, 1961

The Port of New York Authority

LA GUARDIA AIRPORT
MARINE TERMINAL BUILDING
ALTERATIONS
(UNITED STATES WEATHER BUREAU)
CONTRACT LGA-140.011

Sealed proposals for the sale of materials and performance of Work for alterations to certain areas in the Marine Terminal Building at La Guardia Airport for the United States Weather Bureau will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, April 25, 1961, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the

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deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, April 13, 1961

Bids: April 27, 1961

The Port of New York Authority

NEW YORK INTERNATIONAL AIRPORT
SAND AND SALT STORAGE FOR BUILDING 141
CONTRACT O & M 611A

Sealed proposals for construction of a Sand and Salt Storage Building for Building 141 at New York International Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M. o'clock Thursday, April 27th, 1961, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

April 13th, 1961
New York

Bids: May 5, 1961

Board of Education
Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT

The Deputy Superintendent of Schools, Office of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, New York will receive applications for prequalifications from contractors who may wish to submit bids for the proposed hereinafter specified contracts.

For the general construction, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures of: Public School 146 (Addition & Modernization), 98th and 99th Streets, 159th Avenue, Borough of Queens, and Public School 242 (Addition & Modernization), 100-01 Flatlands Avenue, East 100th Street, Borough of Brooklyn.

The prequalification application form must be secured at the Office of School Buildings, Bureau of Construction, Room 407, 42-15 Crescent Street, Long Island City 1, New York and submitted to the Deputy Superintendent of Schools at the same above address.

Bids when advertised, will be received only from prequalified bidders.

The time for submitting prequalification applications by contractors will expire on Friday, May 5, 1961.

Joseph R. Weiss
Deputy Superintendent of Schools

Dated: April 4, 1961

OFFICIAL PROPOSAL

RATE: $2.70 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, P. O. Box 12, New York 36, N. Y.

Bids: May 16, 1961

Request for Bids for Removal of Bridge

Sealed proposals will be received at the office of Wm. J. Hedley, Chief Engineer, Wabash Railroad Company, Railway Exchange Building, St. Louis 1, Missouri, until 12:00 Noon (C.S.T.) on the 16th day of May, 1961, for the removal of the entire structure of a double track railroad bridge 330 ft. long, over the Calumet-Sag Channel near Palos Park, Illinois. Plans, specifications and other information concerning this project can be obtained from the office of the Chief Engineer, Wabash Railroad Company, 1551 Railway Exchange Building, St. Louis 1, Missouri, upon payment of $5.00 per set.

READ THE OFFICIAL PROPOSAL COLUMN OF ENGINEERING NEWS-RECORD THIS WEEK AND EVERY WEEK

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EMPLOYMENT OPPORTUNITIES

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Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. **Permanent position with** established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Soils Technician with laboratory soils test, field exploration and fill control experience. Must be able to assume responsibility for inspection and supervision of earthwork construction. Send resume including photo and salary requirements. Nevada Testing Laboratories, Ltd. 300 West Boston, Las Vegas, Nevada.

Waterworks Superintendent. The City of Rhinelander, Wisconsin is accepting applications for the position of Water and Sewer Superintendent. Letters of application indicating experience, qualifications, training, references, and salary requirements shall be addressed to the Director of Public Works, Rhinelander, Wisconsin.

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Senior Public Health Engineer to direct Division of Sanitation with generalized program in well established County Health Department. Population: 80,182. Vacation cumulative to 25 days, sick leave, retirement, longevity benefits. Salary: open. Must have P.E. in N.Y.S. within 1 year and 5 years of satisfactory sanitary engineering experience. Cattaraugus County Health Department, 302 Laurens Street, Olean, New York. Send application to Dr. Meredith Thompson, 84 Holland Avenue, Albany, N. Y. for approval.

Chief Engineer—Experienced man of mature judgment approximately 45 to 55 yrs. of age to coordinate the design work and exercise general supervision of production activities for a substantial architectural engineering firm in the South. Industrial plants and all allied types of work. Write Box 889, Boston, Mass.

Wanted—Several detailers and/or estimators for rebars, steel joists and similar products. Permanent positions with very well established and growing firm located Central Piedmont Carolinas. State age, education, experience, compensation expected, personal qualifications to P-6344, Engineering News-Record.

Engineer—Water Works—10 years experience in planning installation of pumps, wells, etc. Permanent employment with water works management company. Location—Philadelphia, Pa. Reply P-6357, Engineering News-Record.

(Continued on the following page)

EMPLOYMENT OPPORTUNITIES

• POSITIONS VACANT

Experienced sewer and water superintendent to be affiliated with established construction company in Illinois. Investment in company necessary. P-6378, Engineering News-Record.

Structural steel detailers and checkers, growing company, permanent work. P-6401, Engineering News-Record.

Engineers experienced in water and sewage works projects or related fields. Opportunity for permanent connection with long established consulting firm. Please state full qualifications, experience, references and salary requirements. Location Ohio. P-6498, Engineering News-Record.

Help Wanted—Reinforcing Steel Detailer with a minimum of four years experience. Contact Mr. Dewey Owens, Brocker Mfg. & Supply Co., York, Pennsylvania.

Need prestressed concrete plant manager. Send all qualifications and experience record. Location S. E. Replies confidential. P-6503, Engineering News-Record.

Superintendent, bridge construction, state and Federal projects. Send resume. P-6487, Engineering News-Record.

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Civil Engineer—Six yrs. varied experience. Structural design with emphasis on sewage disposal plants. Sewers design and layout. Programing engr. problems IBM-650. PW-6497, Engineering News-Record.

Superintendent, 29 years experience heavy construction, highway grading, flood control, bridges, asphalt paving. Location immaterial. Reply PW-6493, Engineering News-Record.

Civil Engineer, 19 years experience, Master's Degree, expert several fields—concrete, construction, materials control, soils and administration. Available soon. PW-6507, Engineering News-Record.

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Structural Engineer, Dipl. Ing., 36, European educ. 10 yrs. design exp. in steel and concrete. Well grounded in theory of elasticity to handle complex indeterminate structures. Familiar with prestressed and composite structures. Several languages. PW-6516, Engineering News-Record.

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(Continued on the following page)

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Foreign Policy and Construction

PROPOSALS FOR CHANGES IN FOREIGN AID, which President Kennedy has recommended to Congress, offer opportunities for improvements in administration of the foreign-aid program while taking proper cognizance of changes in world conditions over the past few years.

Unfortunately, the realism that prompted the proposals does not carry through to all facets of the President's philosophy of foreign aid as expressed in his Congressional message. For example, it seems too idealistic to believe we can gear our aid to the degree of effort a country makes to achieve "necessary social and economic reforms." Nor is it realistic to paint foreign aid as an obligation we must assume just because we are wealthy. Foreign aid is not altruism. It is a means of defense. Otherwise, we couldn't afford foreign aid on the scale that we have indulged in it.

One of the constructive proposals the President makes unfortunately lends credence to this false philosophy that foreign aid and defense have different objectives. This is his recommendation that military assistance be transferred from the foreign-aid budget to the defense budget. Nevertheless, this would be a wise move since two different agencies, the Defense Department and the State Department, administer the respective funds. And it would also be wise since it will keep the identity of military assistance and economic assistance plainly evident so that comparisons can readily be made with the economic assistance rendered by other countries. Such comparisons will become more and more significant as the program for joint-aid efforts by European countries and the U.S. takes shape under the new international Organization for Economic Cooperation and Development (OECD).

It is also the hopeful growth in importance of OECD that makes it wise to adopt President Kennedy's proposal that all U.S. foreign-aid economic activities be brought together in a single agency under a single head. It is imperative that the U.S. speak with a single voice if it is to convince other countries to do their share on foreign aid.

From the construction industry's standpoint, the most meaningful of the President's proposals relates to long-term financing of development projects by the U.S. Development Loan Fund (DLF). Congress is apt to balk at anything other than annual appropriations. But we hope that the legislators will be able to find some way to overcome this reluctance, since long-term commitments offer the only effective way to permit large-scale projects to be planned and carried out.

For this next year, the President would allocate $900 million to the DLF, $200 million more than President Eisenhower recommended, but he also wants a commitment now for $1.6 billion a year for the following four years. He also proposes that these long-term loans be made at low interest rates and repaid in dollars instead of in soft currencies as at present.

The fact that the President's proposal contemplates that perhaps two-thirds of our foreign aid henceforth be in the form of loans, instead of grants, is a reflection of changing world conditions and changing viewpoints on the part of underdeveloped countries. Many of them have learned through experience with the World Bank that they can qualify for loans, and that paying for their projects themselves is more satisfying than getting them as gifts. Now, when they can't qualify for World Bank loans, DLF loans will be available to them.

The facelifting for foreign aid that the President has proposed should effect a great improvement. Congress should accept the President's program, remembering that while the expenditures are for economic purposes, they are nevertheless for our defense.

Foreign Policy and MIT

WHILE THE UNITED STATES reconsidered its role in international affairs, its philosophies of economic and military assistance abroad, the Massachusetts Institute of Technology celebrated its centennial last week by demonstrating its own role in international affairs.

It was not strange that this great U.S. institution of higher learning—dubbed Boston Tech in its early days—should turn to matters of international concern in celebrating the 100th anniversary of its incorporation. For MIT, with 3,500 of its 51,000 alumni living outside the U.S. and 11% of its students coming from abroad, is truly an international institution.

MIT, with a Center for International Studies among its score or more of education and research facilities, attracted leaders of thought from thirty nations to Cambridge for its celebration. They represented science, industry, education, the arts and government.

They considered such things as the influences of science and engineering on society in general and on relations between nations; how citizens can steer technology instead of having it steer them; the increasing dependence of government policies on technology; and the teaching of science and engineering in both the newly developing and the more advanced countries. They came also to listen to foreign policy addresses by U.S. Secretary of State Dean Rusk and Great Britain's Prime Minister Harold Macmillan.

One-hundred years ago this April 10, MIT was incorporated. Two days later Fort Sumter was fired upon. The Civil War delayed until Feb. 29, 1865, convening of MIT's first classes. This took place at what founder William Barton Roberts called his "School of Practical Science." And with all that has happened to MIT and the world since, it was fitting last week that international interests should dominate the MIT centennial celebration.

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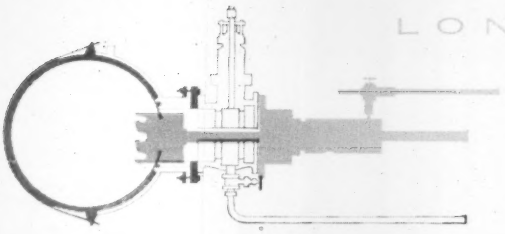

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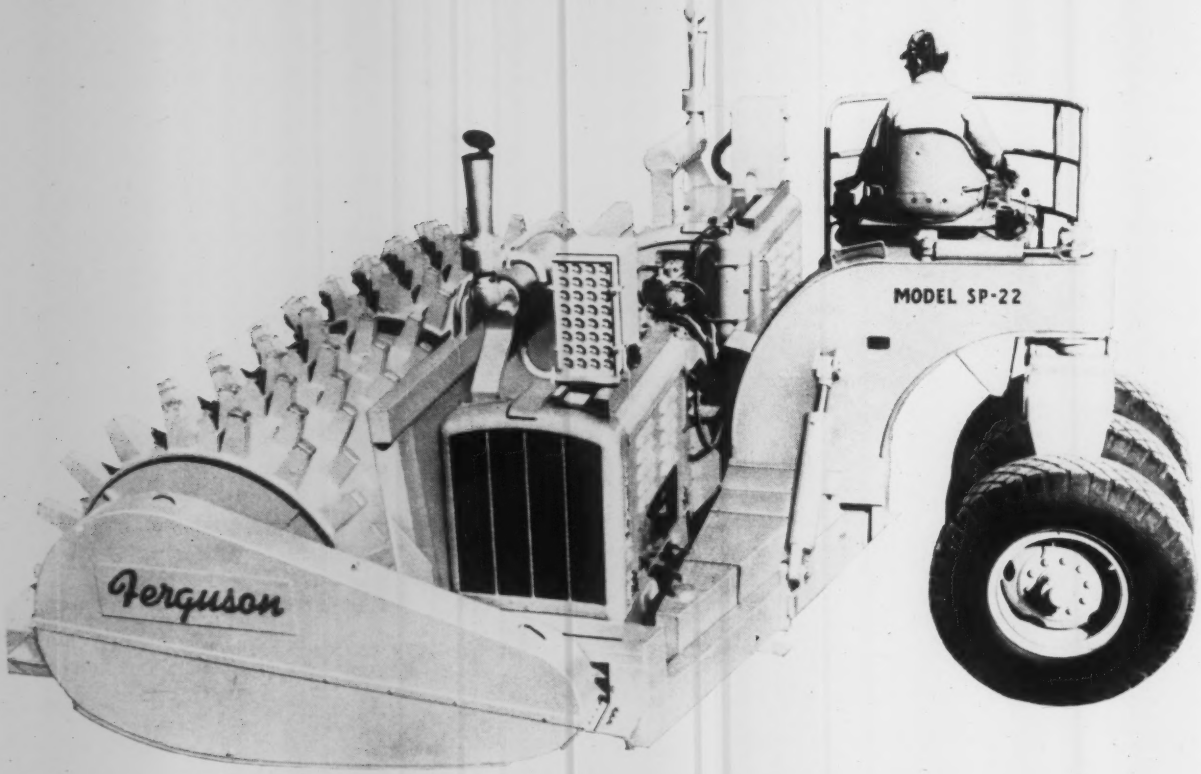

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